

DPD  
SPU

**Joint Ruling**  
**DPD Director's Rule 3-2006**  
**SPU Director's Rule 02-06**

<b>Applicant:</b>  CITY OF SEATTLE Department of Planning and Development Seattle Public Utilities	<b>Page</b>  1 of 38* <small>*plus exhibits and charts</small>	<b>Supersedes:</b>  DPD DR 7-2004 SPU DR 04-04
	<b>Publication:</b>  4/17/06	<b>Effective:</b>  9/1/06
	<b>Subject:</b>  Requirements for Design and Construction of Service Drains (Drainage Water Discharges)	
	<b>Code and Section Reference:</b>  SMC Chapter 21.16	
	<b>Type of Rule:</b>  Code Interpretation	
	<b>Ordinance Authority:</b>  SMC 3.06.040	
	<b>Approved</b>	<b>Date</b>
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<b>Index:</b>  Stormwater, Grading, and Drainage Control Code	<b>Approved</b>	<b>Date</b>
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## **I. BACKGROUND**

DPD reviews and inspects permit applications for private "service drain systems" that convey stormwater, and promulgates rules for such systems. Connection of the private service drain systems will be made to a natural drainage outlet OR approved point of discharge as determined by DPD in consultation with SPU. SPU owns, operates, and manages the City's public sewer and drainage systems in a manner that protects the environment, ensures public safety, and protects both private and public property from damage. This Director's Rule (DR) contains provisions that apply to the private service drain connections served by these public combined sewer and drainage systems. See DPD Director's Rule 2-2006 for applicable provisions for the design and construction of side sewers in relation to wastewater discharges.

## **II. EFFECTIVE DATE**

The provisions of this DR shall take effect on September 1, 2006.

## **III. SERVICE DRAIN WORK DEFINITIONS**

Words and phrases used in this DR, unless contrary to or inconsistent with the context, shall be given the same meaning as in the Seattle Municipal Code, Chapter 21.16 and Chapter 22.801, or as defined below. Unless otherwise defined, all technical or material terminology used in this DR is to be given meaning as commonly accepted in the sewer and drainage trade.

1. **"Applicant"** means an applicant for a master use permit, construction permit, or side sewer permit from the Seattle Department of Planning and Development (DPD).
2. **"Approved Material"** means a material approved by DPD and SPU.
3. **"As-built Drawings"** means an as-constructed side sewer plan that includes all changes made to a project during construction and submitted to DPD.
4. **"Buildover"** means constructing permanent buildings and/or structures over publicly owned pipes.
5. **"City"** means the City of Seattle.
6. **"Combined Side Sewer"** means a privately owned and maintained pipe system that serves both as a service drain and a side sewer.
7. **"Contractor"** means an applicant, owner, developer, registered side sewer contractor, or permittee, unless specifically noted otherwise.
8. **"Cover"** means the depth of material between the top of the service drain and the finished grade immediately above it.
9. **"Curb"** means an edging (as of concrete or asphalt) built along a street to form part of a gutter, part of a sidewalk abutting the street and/or edge of the street paving.

10. **"Curb discharge – Street"** means drainage allowed to discharge through the street curb onto the street pavement from private property.
11. **"Curb discharge – Alley"** means drainage allowed to discharge onto the alley pavement from private property.
12. **"Director of DPD"** means the Director of the Seattle Department of Planning and Development and/or his or her designee, who may be an employee of that department or another City department.
13. **"Director of SPU"** means the Director of Seattle Public Utilities and/or his or her designee, who may be an employee of that department or another City department.
14. **"Downspout"** means a vertical pipe used to drain rainwater from a roof of a structure.
15. **"Drainage water"** means stormwater, rainwater, snowmelt, surface and subsurface runoff which drains from:
  - The exterior of a building or structure.
  - A pervious or impervious surface.
  - Undeveloped land by surface or shallow subsurface flow.
  - Drainage facilities incorporated in a building or structure design.
  - Temporary surface water and subsurface water if it drains or is collected from construction site during the development of a building, structure, edifice, facility, feature, or grading element.
16. **"Emergency"** means there is a present danger or an imminent threat to human health, or that significant property damage is likely to occur if immediate action is not taken.
17. **"Environmentally Critical Area (ECA)"** means land that has been designated and to be protected as required by the Washington State Growth Management Act (GMA). The GMA requires the City to consider the "best available science" in developing codes and policies. It also requires cities to give special consideration to the habitat requirements of anadromous fish, such as salmon.
18. **"Footing drain"** means the drainage system constructed around the foundations of structures to drain away water that may flow to said foundations.
19. **"Grade Release"** means a legal document prepared by DPD as part of a Hold Harmless Agreement that must be executed by the property owner before the contractor begins to backfill. It is required for a slope between 1 -2%.
20. **"Natural outlet"** means a watercourse, pond, lake, wetland, sound, stream, river, ditch, or other body of surface water.
21. **"P-traps"** means a fitting or device to provide, when properly vented, a liquid seal which will prevent the back passage of air, without materially affecting the flow of sewage or waste water through it.

22. **"Pig ports"** means a pressure sealed cleanout used for force-line piping.
23. **"Plumbing outlet, storm"** means a plumbing outlet from a building or structure which carries stormwater or unpolluted water.
24. **"Private Contract Permit"** and **"Utility Permit"** and **"Street Improvement Permit"** means a permit issued by SDOT to install street improvements or public/private utilities within the Public Place.
25. **"Public Place"** means and includes public streets, avenues, ways, boulevards, places, alleys, sidewalks, planting strips, and rights of way dedicated for the use of the public for utilities and similar improvements needed to serve the community.
26. **"Public Combined Sewer"** means a publicly owned and maintained sewage system, which carries drainage water and wastewater and flows to a publicly owned treatment works, and which is designated as such in City records.
27. **"Public Sanitary Sewer"** means a publicly owned and maintained sewage system which carries wastewater and flows to a publicly owned treatment works.
28. **"Public Storm Drain"** means the part of a public drainage control system which is wholly or partially piped, is owned or operated by a public entity, and is designed to carry only drainage water.
29. **"Pump system"** means a pumping station designed to lift drainage flows. The pump is controlled by a standard control center and discharges through a single outlet connection.
30. **"Pump system -- Duplex"** means a pumping station designed to handle the demands of increased flow and capacity applications while providing the enhanced reliability of a second pump. Both pumps are controlled by a standard control center and discharge through a single outlet connection.
31. **"Registered Side Sewer Contractor (RSSC)"** means a person or firm approved and registered by the DPD to construct or repair side sewers located within the Public Place a.k.a. Street Right-of-Way.
32. **"Seattle Department of Planning and Development (DPD)"** means the City department responsible for the developing, administering, and enforcing City standards of the building code and other applicable regulations and ordinances.
33. **"Seattle Department of Transportation (SDOT)"** means the City department responsible for the developing, administering, and enforcing City standards for construction within the Public Place (such as street and sidewalk restoration) and other applicable regulations and ordinances.
34. **"Seattle Municipal Code"** means the legal regulations and ordinances intended to provide for and promote the health, safety, and welfare of the general public as established by chapter and implemented by the City of Seattle through action by City Council.

35. **"Seattle Public Utilities (SPU)"** means the City department responsible for the developing, administering, and enforcing City standards for the construction of public sewers and storm mains and other applicable regulations and ordinances along with their other functions of providing potable water and solid waste functions.
36. **"Service Drain"** means a privately owned and maintained drainage system which carries only stormwater runoff, surface water, foundation drainage, temporary dewatering, and/or other unpolluted waters and discharges to a "natural outlet", side sewer, Public Combined Sewer, or Public Storm Drain. Service drains include, but are not limited to, conveyance pipes, catch basin, catch basin connections, downspout connections, detention pipes and vaults, and subsurface drainage connections to an approved outlet. Service drains do not include groundwater collection systems or footing drains upstream from the point of connection to the catch basin (see section in this DR regarding footing drain connections to service drains).
37. **"Side Sewer Permit for Service Drains"** means a permit that allows the construction of conveyance pipes, catch basins, catch basin connections, downspout connections, detention pipes and vaults, subsurface drainage connections, and other associated facilities for the collection, conveyance, and discharge of drainage water to an approved outlet.
38. **"Side Sewer Permit for Temporary Dewatering"** means a permit that allows temporary discharge of on-site surface and subsurface water flows to existing public drainage facilities, such as during construction activities.
39. **"Site"** means the lot or parcel, or portion of street, highway or other public right-of-way, or contiguous combination thereof, where a permit for the addition or replacement of impervious surface or the undertaking of land disturbing activity has been issued or where any such work is proposed or performed. For development limited to a public street, each segment from mid-intersection to mid-intersection shall be considered a separate site.
40. **"Site Inspector"** means the City DPD Site Inspector performing the inspection work required by the side sewer permit for service drains or as assigned by SPU.
41. **"Street Improvement"** means grading, pavement, drainage devices, or other improvements made to the Public Place whether on, above, or below the ground surface.
42. **"Subsurface Drain"** means a collection device designed to collect drainage water or groundwater from an underground area, such as a drain used under the surface of a playground or golf course or along the exterior footings of a building or structure.
43. **"Thrown Street"** means that the transverse slope of the completed street slopes from one edge to the other edge of the pavement. Control of stormwater runoff from the street is essentially conducted with only the low side of the thrown street. The thrown street is a deviation of the standard

- street cross section which consists of a crowned roadway, sloping down at 2% slope from the crown to the gutter line.
44. **"Use"** means and includes use or occupancy of a public place pursuant to Chapter 15.02 of the Seattle Municipal Code for the purpose of doing work, disturbing the surface, or erecting any structure under, along or over the Public Place.
45. **"Watercourse"** means the route formed by natural processes, generally consisting of a channel with bed, banks, or sides, in which surface water and/or groundwater flows either continuously or intermittently, including lakes, bogs, streams, and creeks.

#### IV. CODES AND STANDARDS

All service drain work shall comply with this DR and the following:

- ✦ City of Seattle Side Sewer Code (Seattle Municipal Code Chapter 21.16).
- ✦ City of Seattle Stormwater, Grading and Drainage Control Code (Seattle Municipal Code Chapter 22.800–808).
- ✦ City of Seattle Environmentally Critical Areas Ordinance (Seattle Municipal Code Chapter 25.09).
- ✦ Latest edition City of Seattle Standard Specifications for Road, Bridge and Municipal Construction and the latest edition Standard Plans **except as otherwise provided in this DR.**
- ✦ Latest edition Seattle-King County Public Health Code Plumbing for plumbing work located within the building or structure.
- ✦ Latest technical manuals such as DPD's Director's Rules (DR).
- ✦ Latest edition SDOT Right Of Way Improvements Manual for work proposed in the Public Place.
- ✦ Latest edition SDOT Street and Sidewalk Pavement Opening and Restoration Rules.
- ✦ Latest edition SDOT Street Improvement Permit Procedures for Construction in Public Right-of-way.
- ✦ Latest edition SDOT Traffic Control Manual for In-Street Work
- ✦ Latest edition Department of Ecology Criteria for Sewage Works Design ("Orange Book").
- ✦ AASHTO Task Force 22 Report – Cross-Reference for Drainage Pipe Specifications for Waterways, Airports, Railroads, Transit and Highways.
- ✦ AASHTO Highway Drainage Guidelines, 3<sup>rd</sup> Edition, Volumes I-XIII.
- ✦ ASTM Volume 08.04 Plastic Pipe and Building Products.

- ♦ Other standards may apply to work in the Public Place.

## **V. ATTACHMENTS**

### **A. Exhibits (pp. 39-60)**

Exhibit 1 – Rigid Pipe Bedding & Backfill Under Pavement Located In A Public Place

Exhibit 2 – Flexible Pipe Bedding & Backfill Under Pavement Located In A Public Place

Exhibit 3 – DIP Pipe Bedding & Backfill Under Pavement Located In A Public Place

Exhibit 4 – Use Of Wye Branches and Cleanouts

Exhibit 5 – Side Sewer Installation Based On Standard Plan No. 283

Exhibit 6 – Side Sewer & Service Drain Connection To A Combined Sewer System

Exhibit 7 – Side Sewer & Service Drain Connection To Separated System

Exhibit 8 – Footing Drain Connection to Private Catch Basin Prior To Discharge Into Combined Sewer System

Exhibit 9 - Footing Drain Connection to Private Catch Basin Prior To Discharge Into Storm Drain System

Exhibit 10 – SDOT Backfill And Pavement Restoration Limits For Side Sewer Construction In A Public Place

Exhibit 11 – Force Main Connection Including Last 10 LF Gravity Side Sewers

Exhibit 12 – Private Catch Basin (w/ Steel Reinforcing)

Exhibit 13 – Private Inlet (w/o Steel Reinforcing)

Exhibit 14 – Flow Spreader Facility

Exhibit 15 – Riprap Splash Facility

Exhibit 16A – Pipe Anchor Detail A

Exhibit 16B – Pipe Anchor Detail B

Exhibit 17 – Curb Discharge/Concrete Culvert With Plate

Exhibit 18 – Curb Discharge/Pipe Culverts

Exhibit 19 – Utility Tunnel For Existing Trees

Exhibit 20 – Retention System

Exhibit 21 – Maintenance Hole Lid using Locking Screws

### **B. Technical Diagramming (pp. 61-66)**

Chart 1 – Service Drain – Catch Basin Area Requirements

Chart 2 – Drainage Requirements

Chart 3 – Service Drain – Curb Discharge

Chart 4 – Service Drain – Downspout

Chart 5 – Service Drain – Footing Drain

Chart 6 – Detention Requirements

## **VI. GENERAL REQUIREMENTS**

### **A. Allowable Materials**

1. This is a list of approved materials for use in service drain construction. It does not constitute a City engineering analysis for installation requirements or site specific factors that must be taken into account during design and construction. Materials listed for service drain pipes only shall conform to the most recent edition of the City of Seattle Standard Plans and Specifications and shall include:

- a. PVC Pipe – ASTM D 3034 SDR 35 (standard minimum wall thickness), 4-inch through 15-inch (See City of Seattle Standard Specification 9-05.3)
- b. PVC Pipe Schedule 40 and Schedule 80 – ASTM D 1785 with fittings per ASTM D 2466 and D 2467
- c. Perforated PVC Subsurface Drain Pipe – ASTM D 2241 (minimum SDR 21), or ASTM D 3034 (See City of Seattle Standard Specification 9-05.3(1))
- d. ABS Pipe – ASTM D 2661 with fittings per ASTM D 3311
- e. Concrete Pipe – Less than 12-inch diameter, ASTM C 14 Class 3; 12-inch or 15-inch in diameter, ASTM C 76 Class IV; 18-inch or larger in diameter, ASTM C 76 Class III (See City of Seattle Standard Specification 9-05.1(1))
- f. Corrugated Polyethylene Drain Pipe (detention pipe located on private property) – Minimum 12-inch diameter, maximum 48-inch diameter, AASHTO M 294, Type S (material not approved for use in Buildover applications) (See City of Seattle Standard Specification 9-05.5(2))
- g. Corrugated Polyethylene Drainage Tubing Drainage Pipe – Maximum 10-inch diameter, AASHTO M 252 (See City of Seattle Standard Specification 9-05.5(1)A)
- h. Ductile Iron Pipe – ANSI A21.51 Class 50 or AWWA C151 (minimum). Glands on mechanical joint pipe and fittings shall be ductile (See City of Seattle Standard Specification 9-05.2)
- i. Vitrified Clay Pipe – ASTM C 700 with joints per ASTM C 425 (See City of Seattle Standard Specification 9-05.4)
- j. Butt Heat Fusion Polyethylene (PE) Plastic Pipe – PE3408 Material per ASTM D 3350 and fittings per ASTM 3261, Minimum SDR 21, less than 12-inch diameter (See City of Seattle Standard Specification 9-05.5(5))

- k. Steel Pipe for Detention – AASHTO M 36 Type I ***[Material not approved for use in the Public place nor as a detention facility in landslide-prone areas nor in Buildover applications]*** (See City of Seattle Standard Specification 9-05.7(5))
- l. Aluminum Pipe for Detention – AASHTO M 196 Type I ***[Material not approved for use in the Public Place nor as a detention facility in landslide-prone areas nor in Buildover applications]*** (See City of Seattle Standard Specification 9-05.6(4))

NOTE: Cellular-core (foam core) pipe is not allowed in the construction of service drains.

## **B. Service Drain Work Definition**

- 1. A **repair** of an existing service drain means the repair, replacement, or any other work done on an existing service drain that is still in service to serve existing facilities.
- 2. An **alteration** of an existing service drain means the installation work done for a new service drain, because of new structure construction associated with existing facilities. The installed service drain connects to an existing service drain or side sewer that is still in service to serve existing facilities.
- 3. A **new** installation of a service drain means the installation of a new service drain because of new structure construction (e.g. The lot is currently vacant or the existing structure has been demolished). Connection may be made to the public main or an existing service drain or side sewer.

## **C. Pipe Bedding**

- 1. All pipes on private property, including detention piping, and pipes in the public area shall comply with the bedding requirements as listed in Table A, Bedding Requirements for Types of Pipe Material. See Exhibits 1 through 3 for examples for bedding and backfill associated with rigid, flexible, and ductile iron pipe materials used for construction within the Public Place.
- 2. All bedding materials and methods shall meet the criteria shown in the City's Standard Plan No. 285 and the City's Standard Specifications under Section 7-17.3(1)B and Section 9-03.16. Bedding materials are to be inspected for compliance and approved by the Site Inspector.
- 3. Approved material (such as pit run gravel, crush rock, or pea gravel) for service drain foundation bedding is required where the DPD Site Inspector determines that soil conditions do not provide sufficient support for the service drain, or where over excavation within the trench has occurred. The project's geotechnical engineer also can provide recommendations for the selection of material, with approval from the Site Inspector.

**Table A, Bedding Requirements for Types of Pipe Material**

TYPE OF PIPE MATERIAL	BEDDING REQUIREMENT
Rigid (Concrete, Vitrified Clay)	Fill and compact to the springline of the pipe with Type 9 aggregate (pea gravel - 3/8" washed gravel). Above the springline of the pipe, native soils used for fill must be compacted per City of Seattle standards. <b>Class C Bedding per City Specifications 7-17.3(1)B2.3</b>
Flexible (Polyvinyl Chloride (PVC), Acrylonitrile butadiene styrene (ABS), Corrugated Metal, Spiral Rib, Polyethylene (PE))	Fill and compact to 6 inches above the top of the pipe with Type 22 aggregate (crushed gravel – 5/8"). See part 2 of this Section. <b>Class B Bedding per City Specifications 7-17.3(1)B2.2</b>
Force Main Rigid	Fill and compact to 6 inches above the top of the pipe with Type 9 aggregate (pea gravel – 3/8" washed gravel). <b>Class B Bedding per City Specifications 7-17.3(1)B2.2</b>
Force Main Flexible	Fill and compact to 6 inches above the top of the pipe with Type 22 aggregate (crushed gravel – 5/8"). See part 2 of this Section. <b>Class B Bedding per City Specifications 7-17.3(1)B2.2</b>
Ductile Iron	Native soils used for fill to the springline of the pipe shall be compacted to provide uniform support. Above the springline of the pipe, native soils used for fill must be compacted per City of Seattle standards. <b>Class D Bedding per City Specifications 7-17.3(1)B2.4 and 7.17.3(3)</b>

#### **D. Pipe Cover**

1. A minimum pipe cover of 1 foot 6 inches is required on private property for flexible and rigid pipes. If the minimum pipe cover cannot be achieved, either the pipe must be embedded in controlled density fill (CDF) or concrete, or ductile iron or Schedule 40 or 80 PVC pipe materials must be used, or as approved by the Site Inspector. See City of Seattle Standard Specifications Section 9-01.5 and 5-05.3(1) for CDF and concrete mix-design requirements.
2. A minimum pipe cover of 2 foot 6 inches at the property line and 5 foot at the curb is required when connecting to a public main. A service drain may be allowed to have less cover at the curb that is located in the Public Place if the site is permitted to

connect to an existing lateral and that existing lateral has less than 5 foot cover at the curb located in the Public Place.

## **E. Pipe Slope**

1. Pipe located in the Public Place shall have a slope of at least 2 percent (1 vertical:50 horizontal) unless a "Grade Release" is obtained from DPD. Pipe slopes exceeding 50 percent (1 vertical:2 horizontal) will require the use of restrained joint ductile iron or solvent welded PVC Schedule 40 or 80 piping materials. A Grade Release will only be issued if the applicant can prove that a 2 percent minimum grade cannot be achieved to the main.
2. Pipe located on private property shall have a slope of at least 2 percent (1 vertical:50 horizontal) unless a "Grade Release" is obtained from DPD. Pipe slopes exceeding 100 percent (1 vertical:1 horizontal) will require the use of restrained joint ductile iron or solvent welded PVC Schedule 40 or 80 piping. A Grade Release will only be issued if the applicant can prove that a 2 percent minimum grade cannot be achieved to the main.
3. Pipe located on private property being repaired, having an existing slope of less than 2 percent (1 vertical:50 horizontal), may have to be chased until a 2 percent minimum grade can be obtained. A Grade Release will only be issued if the applicant can prove to the Site Inspector that a 2 percent minimum grade cannot reasonably be achieved by further pipe reconstruction to the main.
4. A service drain pump may be required by DPD if the service drain has less than one percent slope.

## **F. Pipe Clearances**

1. Ductile iron or solvent welded PVC Schedule 40 or 80 pipe shall be used on installations that do not meet the following minimum clearances and shall extend at least five feet beyond the abutting utility line:
  - a. There shall be at least 6 inches vertical separation between the existing side sewer and the new service drain, except at the point of connection between the two lines, if they are designed to be connected.
  - b. There shall be at least 12 inches horizontal separation between the existing side sewer and the new service drain, except at the point of connection between the two lines, if they are designed to be connected.
  - c. Service drains installed below an existing water main shall be at least 6 inches clear in the vertical distance and 12 inches clear in the horizontal distance from the water main.
2. Ductile iron pipe shall be used for all service drains crossing over water mains, for a perpendicular distance of five feet from the center of the water main.
3. Whenever a new service drain clears an existing or new utility service by 6 inches or less, polyethylene plastic foam shall be placed between the pipes for cushioning prior to backfilling.

## **G. Minimum Pipe Sizes**

1. Service drains in the Public Place shall be a minimum of 6-inches in diameter. Service drains which are permitted to discharge to a curb face may use pipe smaller than 6 inches in the Public Place. See Part VII Section K, Curb Discharge of this DR for further information.
2. Service drains that serve one unit shall be a minimum of 4 inches in diameter on private property.
3. Service drains that serve two or more units shall be a minimum of 6 inches in diameter on private property.
4. Service drains that serve commercial or industrial sites shall be a minimum of 6 inches in diameter on private property.
5. Service drains and side sewers being merged together at the Public Place shall be a minimum of 6-inches in diameter downstream of the merged connection.

## **H. Fittings**

1. All fittings shall be factory-produced and designed for installation on the pipe to be used. All fittings must meet minimum standards per Part VI Section A (General Requirements – Allowable Materials).
2. The maximum deflection at any one fitting shall not exceed the manufacturer's recommendation.
3. Double and triple wyes are not permitted if one of the branches normally ends up as a 90 degree bend.
4. The maximum deflection of any combination of 2 adjacent fittings shall not exceed 45 degrees (one-eighth bend) unless the following adjustment is made:
  - a. adjacent fittings are spanned by a straight pipe of 2 feet or more in length;
  - b. adjacent fittings are spanned by a straight pipe less than 2 feet in length (with Site Inspector's approval) due to field construction restrictions (such as close proximity of service drain to building foundations); or
  - c. The two fittings are wyes, and there are cleanouts installed (to grade) on the downstream straight legs of both fittings to allow cleaning between the fittings and downstream of the second fitting. See Exhibit 4. Also see Part VI, Section J, Cleanouts.
5. The maximum deflection of 90 degrees cannot be accomplished with the use of a 90 degree elbow (short 90° radius, long 90° radius or long sweep 90° radius) unless noted in the Downspout Section of this DR.
6. Catch basins may be used to change pipe directions up to 90 degrees.
7. If reverse wyes are used (e.g. for a temporary test tee), they must be brought to grade and finished as cleanouts.

## **I. Pipe installation**

1. Bell and spigot pipe shall be installed with the bell end up-grade.
2. Rigid pipe shall be installed in a straight line and at uniform grade between fittings.
3. Flexible pipe may be installed in a slight curve alignment per the manufacturer's recommendations and at uniform grade between fittings.
4. Pipe should be installed starting at the downstream connection whenever feasible.
5. All pipe shall be installed in a manner such that the Site Inspector can verify the pipe material (i.e. print-side up).
6. All changes in grade or line shall be made with 45° or 22 ½ ° bends, wyes or catch basins for service drain pipe.
7. Connections shall be made with rubber gasket, mechanical joint, or compatible solvent, depending on pipe type and fitting design. All connections shall conform to the manufacturer's specifications.
8. Flexible connections shall be used for piping when the area is located in an area classified as liquefaction or in a settlement sensitive area classified as "peat."
9. Surface mounting of service drains using ductile iron pipe with restrained joints or solvent welded PVC Schedule 40 or 80 pipe and anchoring may be allowed for those situations in which trenching and backfilling are inappropriate such as in steep slope areas or when a proposed service drain must cross an existing deck. Anchoring systems must be designed and stamped by a licensed professional engineer. See Exhibits 16A and 16B.

## **J. Cleanouts**

1. At least one cleanout shall be provided for each total change of 90 degrees in grade or alignment; or every 100 feet of pipe length including the change in grade or alignment.
2. Cleanouts shall consist of a wye branch in the service drain and/or upstream end.
3. All cleanouts located in the Public Place shall be extended to grade and shall be bolted down (drilled and tapped). Cleanouts may be located within the Public Place per Standard Plan No. 278 & 280 subject to approval by SDOT.
4. A cleanout is required to be installed adjacent to the building foundation on the upstream reach of the last wye branch in the side sewer if no more changes in grade or alignment occur and the reach of pipe is less than 100 feet (see Exhibit 4 of this DR).
5. In addition to Paragraph 1 above, a cleanout is required to be installed on the upstream reach of the last wye branch in the service drain serving a building or structure and the reach of pipe is less than 100 feet (see Exhibit 4 of this DR).
6. For situations where the site conditions preclude the normal placement of cleanouts, or building conditions preclude placement of a cleanout within close proximity

to the building structure, two cleanout assemblies may be constructed in close proximity to each other but in a reverse direction. This will facilitate both upstream and downstream pipe cleaning.

7. Downspouts may qualify as cleanouts provided there is three or less bends before connecting to the service drain.

## **K. Maintenance Holes**

1. **Note Maintenance Hole Construction Restriction:** Service drains requiring new connections to public mains must utilize core tapping procedures shown in Table B below. If proposed service drain pipes do not have diameters that allow direct core tapped connections to the existing public pipe system, service drain pipes must be split into smaller pipe sizes (e.g. two 6-inch pipes) on the subject property. This may be accomplished using an appropriately designed flow splitter or by having separate drainage connections, such as for different portions of the proposed structure. If the applicant demonstrates to SPU that flows cannot be split amongst several pipes and connected per the core tapping schedule in Table B, connection of the service drain to the public combined sewer or public storm drain system shall require a maintenance hole or rolled tee at SPU's discretion.

2. Any service drain 300 feet or more in length, and having a minimum pipe diameter of 6-inches, shall, at a minimum, have a maintenance hole located every 300 feet.

3. Clearly label maintenance holes located on private property which are part of a private service drain system as "Private".

4. Private maintenance holes are generally not allowed to be constructed in the Public Place.

5. On private property, use a 3-bolt locking maintenance hole ring and cover (See Exhibit 21 of this DR) in lieu of the "locking cam" maintenance hole ring and cover shown in Standard Plan 230.

6. Public maintenance hole construction shall be included with the "Side Sewer Permit for Service Drains" but will require SPU coordination/inspection/approval during the installation of the maintenance hole onto the existing public main. The RSSC must notify SPU 48 hours prior to beginning work on excavation and installation of the maintenance hole.

**Table B, Core Tap Connection Requirements for Lateral Connections to Existing Public Mains**

MAINLINE SIZE	LATERAL SIZE CONNECTION TO PUBLIC MAIN (New MHs or Tees Require SPU Approval)			
	6-Inch	8-Inch	10-Inch	12-Inch
8-inch	Core Tap Req'd	NA	NA	NA
10-inch	Core Tap Req'd	NA	NA	NA
12-inch	Core Tap Req'd	Core Tap Req'd	NA	NA
14-inch DIP	Core Tap Req'd	Core Tap Req'd	NA	NA
15-inch	Core Tap Req'd	Core Tap Req'd	NA	NA
16-inch DIP	Core Tap Req'd	Core Tap Req'd	NA	NA
18-inch	Core Tap Req'd	Core Tap Req'd	NA	NA
20-inch	Core Tap Req'd	Core Tap Req'd	Core Tap Req'd	NA
21-inch	Core Tap Req'd	Core Tap Req'd	Core Tap Req'd	NA
24-inch & Larger	Core Tap Req'd	Core Tap Req'd	Core Tap Req'd	Core Tap Req'd

NA – Not Allowed

## **L. Piping to Accessory Buildings**

1. If there is a requirement by the Seattle-King County Plumbing Inspector for the Site Inspector to inspect a lateral line from an accessory building, then the installed line shall meet the minimum diameter pipe and use the proper bedding per this DR. Piping within the building shall be inspected by the Seattle-King County Plumbing Inspector.

## **M. Pumps**

1. If a pump is required to connect the service drain force line to a side sewer or public main, the permittee shall attach a copy of the pump manufacturer's specifications to the side sewer permit for service drains. The pump specifications shall include gallons per minute (gpm) and the total system head (static head and dynamic head).

2. Pumps shall be standard manufacture and shall be specifically designed for the applicable use (e.g., drainage discharges for a specific project) using the pump manufacturer's recommended operating guidelines. Pump sizing data and/or calculations shall be submitted to DPD during the review process of a routed plan set.

3. No more than one property shall be connected to any pump system, including the force-line, unless authorized by DPD and Seattle-King County Public Health.
4. An electrical permit is required for an electrical hookup of a pump if a new circuit is required for the pump.
5. A duplex pump system is required for non-residential structures, such as factories, large business and office structures, restaurants, and processing plants. Residential structures, including multi-unit residential structures, and small non-residential structures, such as warehouses or office structures with low volumes of drainage discharges, may not require the installation of duplex pumps.
6. A duplex pump system is required for projects located within an ECA when the pump system is located at the top of a steep slope. The duplex pump design shall use a 25 year storm event provided there is a 100-year detention facility incorporated with the drainage design.
7. The discharge pipe (force-line) shall have a non-corrosive check-valve, a "quick-release" connector/fitting, and a non-corrosive gate-valve to facilitate pump removal. The pipe shall be PVC Schedule 40 or Schedule 80 or ductile iron or as approved by the Site Inspector.
8. A force-line pipe may not connect directly to a public main. Prior to connecting to the public main, the force-line shall discharge into a standard, gravity-flow section of service drain pipe that is at least 10 feet in length (see Exhibit 11).
9. Force-line sections of pipe are required to have "Pig ports" for each of the following two conditions: 1) A maximum of 100 foot intervals and 2) Wherever fitting bends total 135°.
10. If the force-line pipe needs to be covered and the pump(s) are not available for testing, or if testing of the discharge piping is impracticable, then the owner will be required to execute a Hold Harmless Agreement with King County if pressure testing of the discharge piping system is impracticable.
11. The inlet line to the pump receiving tank (wet well) shall meet standard service drain specifications as outlined in this DR.
12. If a separate pump is used for the stormwater system only, the pump shall be installed in a chamber that is readily serviceable. The tank shall be made of non-porous, non-corrosive, structurally sound material such as plastic, fiberglass, stainless steel, or concrete.
13. Pump systems shall be designed and installed to provide easy access from the ground surface to all mechanical and electrical devices.
14. The force main pipe located outside the building must withstand the line pressure per the testing requirements found in Section R of this DR. DPD also requires that the pump be operational prior to finalizing the permit.
15. An audible alarm system is recommended for pump systems.
16. Pumps located within a building are subject to Seattle - King County Public Health inspection.

## **N. Special Requirements**

1. No new building or structure or new building or structure addition may be constructed or relocated over an existing service drain unless the pipe that will be covered by the new or relocated structure meets the specifications of the Seattle-King County Plumbing Code and regulations of Seattle-King County Public Health.
2. Any survey monuments located within the block of the project area shall be surveyed by SPU surveyors before and after completion of the work if the construction activity threatens or may cause disturbance to the monuments. The owner and/or contractor shall coordinate the survey with the SPU Survey Section. Further, the owner and/or contractor shall be responsible for the expense of both surveys, including the resetting of the monument by SPU, if shifting has taken place.
3. The service drain pipe invert at the Public Place (right-of-way) line shall be at least one foot higher than the crown elevation of the public main at the location of the service drain connection. See Exhibit 10 of this DR. In instances where achieving this slope requirement reduces the pipe cover below 2 foot 6 inches (minimum standard) at the property line, ductile iron or PVC Schedule 40 or 80 pipe materials shall be used.
4. The contractor shall connect all outlets from plumbing fixtures and/or drainage facilities unless specifically noted otherwise on the application, plat, and/or permit, and approved by the City.
5. Where the main sewer is a combined sewer, the new side sewer and service drain line on private property shall be separated to the street property line and one connection to the public main shall be made. See Exhibits 6 and 8.
6. Where the main sewer is a combined sewer, the connection of the existing side sewer and service drain line can remain in the same configuration under a repair permit for service drain repairs.
7. Where the main sewer is a combined sewer, the connection of new service drains to existing side sewer and service drain lines can occur provided that the new construction does not exceed 750 square feet. Building construction exceeding 750 square feet shall require the separation of the new side sewer and/or service drains to the Public Place and connection to occur depending on the availability of public mains located in the Public Place.
8. Any service drain pipe laid in a steel casing shall be laid in minimum lengths of 8 feet, and the joints of the service drain pipe shall be of watertight material. The casing shall be sealed at both ends using cement slurry or approved material. Service drain pipes within casings that are less than eight feet in length may use pipe segments shorter than eight feet.
9. The RSSC is responsible for locating any stub in the Public Place that was installed as part of a City sewer construction project or as part of a previous private development. If the public main is not located in the Public Place, a RSSC is not required to perform this work. The permittee shall coordinate with SPU any excavation work for the connection prior to encountering the main. In addition, the RSSC or permittee is responsible for determining that the stub is in an operative condition.

Verification may include a flow test done in the presence of a Site Inspector. See the following section on Existing Stubs and Tees.

10. If a project proposes to connect to an existing, inactive service drain or combined side sewer stub on a public main, the permittee is required to complete a TV inspection of the existing stub before the permit is finalized by the Site Inspector. For the purposes of this DR, an inactive stub is a lateral connecting to a public main that is not in use by the project or another property at the time of permitting (e.g. a capped service drain). A copy of the TV inspection shall be submitted to the DPD Site Inspector with the project address, date of TV inspection, DPD permit number, and general location of the stub in relation to the project site. The inspection recording may be in VHS or DVD format.

The tape will be used by SPU for data collection and will not affect the project's connection authorization. As stated above, the permittee is responsible for determining that the stub is in operative condition. See the following section on Existing Stubs and Tees for more information on connection requirements for existing stubs and tees.

11. Existing service drain piping that serves the adjoining neighbor may exist on the permittee's property. If the existing service drain is to be relocated outside the new building footprint, service drain materials and construction shall conform to this DR. If the existing service drain will be covered by a new building or structure, the service drain must be upgraded under a plumbing permit issued by Seattle-King County Public Health. Materials and construction shall conform to the Seattle-King County Plumbing Code.

12. Existing service drain piping that is located on the adjoining neighbor's property without a recorded easement and serves the permittee's property is presumed by the City to be valid by prescriptive right for said service drain piping for the permittee to repair and maintain. However, if the neighbor denies access to the permittee over the neighbor's property, the permittee may be required to provide a new service on the permittee's property or successfully resolve the issue with the neighbor in order to repair and maintain piping located on the adjoining neighbor's property.

13. The owner and/or contractor are responsible for demonstrating that the as-built improvements are located according to the property lines and/or Public Place. A survey prepared by a licensed surveyor may be required by the City if it is deemed unclear from the location of the existing improvements and the constructed service drain improvements as they relate to private property and/or Public Place.

14. Side Sewer Permits for Service Drains are issued with specified minimum Site Inspector inspection hours. If the total number of inspection hours exceed the initial allotted permit inspection hours, the permittee will be charged for the additional hours. Inspection hours will include the time the DPD Site Inspector has to spend on verification of the as-built service drain plan and/or added research and investigation due to discovery of piping not previously identified on the City's side sewer mapping documents. One way travel time is included with the inspection hour(s).

## **O. Existing Stubs and Tees**

1. The RSSC is responsible for notifying the Site Inspector **AND** SPU field crews if the RSSC discovers a broken stub or tee or breaks an existing stub or tee. The RSSC

shall have a responsible person remain at the site until BOTH the Site Inspector **AND** SPU field crews arrive at the site. SPU and DPD will arrive on site within a reasonable amount of time after being contacted by the RSSC (usually in four hours or less).

2. If the public main is not in the Public Place (e.g. it is located in an easement through private property), a RSSC is not required to do the excavation and connection work associated with an existing stub or tee. The permittee shall coordinate with SPU any excavation work for the connection prior to encountering the main.

3. It will be the responsibility of the RSSC to locate and use an existing stub or tee. SPU and DPD will not be held financially responsible for work associated with locating or connecting to an existing stub or tee.

4. If an existing stub or tee cannot be located in the field based upon dimensions from the engineering record drawings, the RSSC will still be responsible to have a new tee installed by SPU.

5. If a project proposes to connect to an existing, inactive stub or tee that is not being used by this or another project at the time of the connection, the RSSC or permittee is responsible for verifying that the tee or stub is in good condition and is functional. Prior to finalizing the permit for this connection, the RSSC or permittee must perform a TV inspection of the existing, inactive stub (e.g. a capped service drain) from the point of connection to the public main. The RSSC must then present a copy of said TV inspection to the DPD Site Inspector before the permit associated with the connection is finalized. The copy of the TV inspection shall include the project address, date of TV inspection, DPD permit number, and general location of the stub in relation to the project site. The tape will be used by SPU for informational purposes only, and will not affect the project's connection authorization. If the stub is capped at the main or has been covered by a previous pipe relining process within the main, the permittee shall be financially responsible for having the cap or liner removed. If a connection is proposed to an existing tee, a visual inspection shall be done in the presence of the Site inspector prior to the connection being made. If an existing tee is found to be broken or inadequate for connection, SPU must be contacted to decide if the tee can be repaired or if a new connection to the main must be made.

6. It is the responsibility of the RSSC to complete trenching and shoring operations per Washington State Department of Labor and Industries (L&I) standards. SPU crews will not enter an excavation that is improperly shored or is considered inadequate to protect the health and safety of SPU workers. If SPU crews are unable to enter an excavation due to perceived shoring deficiencies or safety concerns, the RSSC's competent person must come to agreement with SPU crews on improvements or measures that must be taken to correct the situation. SPU shall not be liable for shoring conditions or costs associated with shoring improvements due to safety concerns. See the Trench Shoring section of this DR for additional information. If disputes regarding shoring adequacy cannot be resolved, the issue may be referred to L&I staff for investigation.

## **P. Emergency Repairs**

1. Contractors may commence emergency repairs without a side sewer permit for service drains if the work starts after City business hours. Owners or contractors are required to apply for a side sewer permit for service drains permit on the next City business day after repairs have started. Contractors who have made financial arrangements with DPD may obtain service drain repair permits on-line at the DPD Side Sewer Web site. Any emergency work in the Public Place must comply with SDOT's Traffic Control Manual regarding issues such as street use permits and traffic control.
2. Emergency repairs may include trenching, repairing pipe, installation of new pipe, and bedding only. Trench backfilling may not begin until DPD has inspected and approved the pipe and installation.
3. If over 10 feet of new service drain piping has been installed, then trench backfilling may not begin until DPD has inspected and approved of the pipe and installation, and all pressure testing has been done in the presence of the DPD Site Inspector. All new connections shall also be inspected and tested before the trench is backfilled.
4. Trench backfilling can be done if the health, safety, and welfare of the general public are a concern and DPD has not done an inspection of the new piping. The contractor shall provide a video showing the inside of the newly installed piping and provide representative photos showing the pipe and the bedding material. The contractor must also have the property owner execute a Hold Harmless Agreement before the permit is finalized.
5. The process for pipe lining and pipe bursting will not be permitted as an emergency repair procedure.

## **Q. Pipe Lining and Pipe Bursting**

1. Pipe lining and pipe bursting are allowable methods for the repair of service drains using materials compatible with the diameter and pipe type of the existing service drain line. However, due to possible impacts to and required use of SPU utilities (e.g. public maintenance holes and mainline to access laterals) during the repair process, the registered side sewer contractor (RSSC) must contact SPU Utility Systems Management (USM) Division for approval. At a minimum, the contractor will be required to provide a copy of a TV inspection of the SPU main at the point of the rehabilitation work after work is completed. As such, the proposal as described below must be followed when pipe lining or bursting are proposed for the service drain repair. There may be other pipe lining processes that require one access point but SPU shall still be notified when this technology is being proposed to repair a service drain.
2. The RSSC or subcontractor performing the proposed reline work shall have a current license agreement with the product manufacturer/assembler. Additionally, the individuals performing the reline work shall be certified by the product manufacturer/assembler.
3. Use of trenchless technologies to repair/upgrade service drain is allowed if there are no conflicts with other underground utilities. The contractor is responsible for

identifying and protecting existing underground utilities, including contacting utility locating services and consulting with existing utility records as needed.

4. The contractor must notify SPU USM of the proposed pipe lining and pipe bursting work 48 hours prior to start of excavation or construction by the contractor if proposed work will be in the Public Place or will impact, be adjacent to, or require the use of SPU facilities.
5. No on-site inspection for pipe lining or pipe bursting will be performed by the City except as noted below.
6. Pipe lining and pipe bursting repair work must conform to current ASTM Standards for pipe lining and pipe bursting, including ASTM F1216. Pipe lining installation shall be in accordance with the requirements of the product manufacturer/assembler and as directed by their technical representatives. Prior to pipe reline work, the existing side sewer must be cleaned, root cut, jetted, rodded, and otherwise cleaned to a condition that allows for reline work to be effective per the manufacturer's recommendations. The contractor shall provide information to DPD as requested during issuance of permit or site inspection.
7. If PE fuse-welded pipe is proposed for service drain work, a design of the connection point to the existing pipe must be submitted to SPU by a licensed engineer or the pipe-bursting contractor for SPU approval prior to permit issuance. Due to pipe-bursting strain and/or temperature affects on PE pipe during installation, the pipe will be required to rest for at least 24 hours (or as long as recommended by the manufacturer, whichever is longer) prior to the final pipe cutting and the connection being made to the existing pipe to allow it to achieve equilibrium.
8. Repair of the existing service drain piping in order to insert the pipe lining or pipe bursting material will require a Side Sewer Permit for Service Drains and DPD inspection for installation of new pipe, liner, testing, and backfill.
9. Any pipe reline material protruding into the main must be trimmed flush with the inside wall of the main. SPU will not approve any reline work that adversely impacts SPU facilities, and DPD will not finalize any Side Sewer Permit for Service Drains involving reline work near the main without SPU approval.
10. A pressure test shall be required for pipe lining and pipe bursting work that has two access points.
11. If site conditions change, and if pipe bursting or relining is proposed after a permit has been issued, the applicant must update the Side Sewer Permit for Service Drains to reflect the new work accordingly.

## **R. Testing**

1. Drain lines upstream of their connection to the lowest open point of the service drain located on private property are not required to be pressure tested. Pressure testing of the balance of the system of piping between the lowest open point of the service drain and piping in the Public Place is required and shall be conducted in the presence of the Site Inspector.

2. Catch basin outlet lines discharging to natural water courses on private property are not required to be tested.
3. Pressure testing is not required for service drains using weep hole outlets.
4. When using water for testing, leakage shall be no more than 0.28 gallons per hour per inch inside diameter per 100 linear feet of pipe, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural groundwater table at the time of test, whichever is higher.
5. Testing may also be done by air pressure according to the City of Seattle Standard Specifications 7-17.3(4) B, Exfiltration Test, with low-pressure air by the pressure drop method.
6. If a pipe joint fails to pass the water or air pressure test, it shall be repaired in a manner acceptable to the Site Inspector. If not repairable, the damaged pipe section shall be replaced with a new one and the joints retested as specified above.
7. If the existing downstream service drain pipe fails to pass water flows adequately in a manner to indicate there is no downstream blockage, impairment, and/or restriction, the Site Inspector will notify the contractor and the owner of the apparent blockage or restriction and will also note the downstream flow problem in their field report.

## **S. Capping**

1. At each end of a pipe designated to be permanently capped, the pipe end shall be completely filled with concrete for a minimum length of 12 inches.
2. A side sewer permit for capping shall be required for projects having a demolition permit only.
3. A side sewer permit for capping will not be required for projects having a demolition permit and a construction permit since the temporary capping is considered incidental to construction.

## **T. Connections to Mains**

1. New service drain connections to the mainline shall be installed at a 90 degree angle to the main line sewer (in plan view). Refer to Exhibit 10 for the connection detail for a 30 to 45 degree angle to the main line (in section view) for a new core tap.
2. Service drains connecting to mains shall be at least one standard pipe diameter size less than the main (i.e. 6-inch service drain connection to 8-inch or larger storm drain or combined sewer main). New connections must be sized or split as appropriate to allow SPU to core tap a new connection without requiring a new MH or tee for the proposed connection. Refer to Section K and Table B, Core Tap Connection Requirements for Lateral Connections to Existing Mains in this DR.
3. Before excavating for service drain work, the Contractor shall review information available from the City to verify elevations and locations of the storm drain or combined sewer infrastructure. The contractor shall also check the information made available by the City to ensure that field conditions match the as-built data.

4. Rolled tees (if allowed by SPU) and core taps will be done by SPU staff and must be scheduled and coordinated by the RSSC or permittee. If allowed by SPU, maintenance hole construction shall be done by the RSSC and shall require SPU inspection and material approval

5. Connections to existing public mains via new public maintenance holes are not allowed unless it falls under Section K, Maintenance Holes, of this DR. Connections to existing public maintenance holes are allowed only under special circumstances, and must receive permission from SPU prior to being permitted. If a service drain is allowed to connect to an existing public maintenance hole, it must be constructed to match crowns of the existing pipe(s) in the maintenance hole. The maintenance hole shall be rechanneled by the RSSC as required by SPU. Maintenance hole connections shall be done by the RSSC and require SPU inspection and material approval. The RSSC must notify SPU at least 48 hours prior to beginning work on excavation and connection to a public maintenance hole.

6. SPU will install all core taps and rolled tees on public culverts even if they are not in the Public Place. However, the service drain work associated with this type of connection need not be performed by a RSSC if it is not in the Public Place. The contractor or permittee shall contact SPU prior to preparing for such a proposed connection and if restoration by the permittee is acceptable. Service drain work associated with public culverts and ditches in the Public Place must be performed by a RSSC, and shall be permitted, constructed, and inspected per these and other relevant rules for connections to public drainage systems.

## **U. Trench Shoring**

1. Trenching and shoring considerations shall be the responsibility of the contractor's competent person who has the training, the experience, the knowledge, the ability to detect deficiencies and hazards, the authority to take prompt corrective measures to eliminate existing and predictable hazards, and the authority to stop work when required.

2. If the Site Inspector believes that working conditions are hazardous or that the competent person is unavailable during construction, the inspector may defer the matter to Washington Department of Labor and Industries (L&I) for further investigation. Trenching and shoring by the RSSC shall comply with L&I requirements.

## **V. Plan Required at Issuance of Side Sewer Permit for Service Drains**

1. The applicant for a Side Sewer Permit for Service Drains that includes a new service drain serving a new building or addition to a building exceeding 750 square feet (i.e. project requires drainage review) shall submit to DPD a copy of the approved building permit plan set with a cover sheet containing the DPD reviewer's stamps, signatures, and side sewer plans. Said plans will become reference documents for the Side Sewer Permit for Service Drains.

2. The applicant for a Side Sewer Permit for Service Drains that includes a new service drain serving an existing structure shall submit a drawing of the intended service drain work, and said drawing will become reference documents for the Side Sewer Permit for Service Drains.

3. The applicant for a Side Sewer Permit for Service Drains that includes only a repair to the existing service drain is not required to submit a drawing of the intended service drain repair work.

#### **W. Service Drain Construction in an Environmental Critical Area (ECA)**

1. Repairs of existing service drains located in a designated ECA can receive a Side Sewer Permit for Service Drains per SMC 25.09.040 A, Permits and Approvals Required.
2. Construction of new service drains, if located outside the ECA, may receive a Side Sewer Permit for Service Drains per SMC 25.09.045D. This does not apply to infiltration systems located within 500 feet of Geologic Hazard Areas, per Section 3.2 of DR 26-2000.
3. New service drain construction proposed within a designated ECA (with the exception of the ECA 5, Liquefaction and ECA 7, Landfill) will require a DPD geotechnical and/or environmental approval. DPD Drainage Q-drain review will note the following as a requirement during the building plan review for a permit:
  - a. Service drains for construction are to be detailed and reviewed in conjunction with a building permit. The Side Sewer Permit for Service Drains shall include the approved building permit plans showing the service drain and its construction.
  - b. The private geotechnical engineer and/or environmental consultant will address the proposed service drain and its construction and provide the inspection to ensure compliance with the ECA requirements.

#### **X. Existing Trees and Pipe Trenching**

All service drain construction shall avoid digging the trench within the dripline of existing trees in the Public Place. See City of Seattle Standard Plan 133 and Section 1-07.16(2) of the City's Standard Specifications. Exhibit 19 provides an alternate method for tunneling near tree roots on private property. However, if there is no alternative, certain conditions shall apply including:

1. Trenches shall be constructed no closer than half the distance from the tree trunk to the dripline.
2. Roots shall be cut with sharp instruments to reduce the potential damage to the tree.
3. The trench shall be backfilled within the shortest amount of time possible, and the soil shall not be compacted, unless directed by the Site Inspector.

#### **Y. As-Built Drawing**

1. Before a permit will be finalized, an as-built drawing shall be prepared and submitted by the contractor or property owner that includes all changes made to a service drain project and submitted to DPD for review and approval.

2. A side sewer site plan template at a scale of 1" = 20' will be issued at the time the Side Sewer Permit for Service Drains is obtained from DPD. The template will contain the following information:

- ♦ Existing side sewer, service drain, and mainline infrastructure
- ♦ Property lines
- ♦ Site address
- ♦ Building roof outlines
- ♦ Building foundation lines or "footprints" where available
- ♦ Edge of pavement (within the right-of-way only)
- ♦ North arrow

3. At the time of the service drain inspection, the Site Inspector will check the template to ensure that the as-built service drain information prepared by the permit holder is accurate and complete. All efforts should be made by the permittee to provide a clean, accurate, readable, and precise as-built document to the Site Inspector.

4. Arrangements should be made between the permittee and the Site Inspector with respect to showing references of newly constructed facilities located in the Public Place as the as-built plans for Private Contracts may not be completed and filed with SPU during the time that the service drain as-built plan is being prepared by the RSSC and verified by the Site Inspector.

5. Time spent by the Site Inspector to review, verify, and/or correct the service drain as-built plan shall be charged to the Side Sewer Permit for Service Drains per SMC 21.24, Permit Fees and Connection Charges. The Site Inspector will note on the Site Inspection Report that added review will be required and that possible corrections may be the result of the review.

6. An architectural site plan or engineering drainage/utility plan may be used as the service drain site plan template. It is recognized that the building outline and other features represent a more accurate picture of the new construction. The permit holder may use these plans provided the following information has been furnished:

- ♦ DPD Site Inspector has been notified of the use of the site and/or drainage/utility plan;
- ♦ Full-size sheet used. (No partial sheets shall be used for the as-built.);
- ♦ Existing side sewer, service drain, and mainline infrastructure accurately transferred from the side sewer site plan template;
- ♦ If the architectural site plan or engineering drainage/utility plan has not been prepared as a Computer Aided Drafting (CAD) drawing, all lettering shall be in upper case and the lines, fonts, leaders, and other graphical presentation shall be clear and precise;
- ♦ The as-constructed service drain information has been accurately and clearly delineated onto the site plan. The plan will not be accepted if the as-built information cannot be read due to the poor quality of the as-built information or

the fact that the site plan contains so much information that it makes the side sewer data difficult to read;

- ♦ Measurements in the Public Place shall be noted onto the site plan if construction has occurred in the Public Place; and
- ♦ Street address and permittee/permit (A/P) number are noted on the plan.

The site plan or drainage/utility plan sheet shall be reviewed with the Site Inspector before proceeding to use these plans as the service drain as-built template.

## **Z. Video Summary**

Video or TV inspection work is required for various service drain work discussed in this DR. To assist contractors and other users of this document, this section provides a summary of areas in the DR that require video inspection. Details for each inspection and procedure must still be followed, and the contractor is responsible for identifying the requirements in the City's respective Codes and the related Rules for their work. TV inspections and recordings must generally meet the requirements listed in Section 17-17.3(4)I of the City of Seattle Specifications regarding parameters such as quality of work and lighting.

1. Special Requirements section; provide a video inspection of existing, inactive stub to DPD Site Inspector prior to finalizing the permit.
2. Emergency Repairs section; provide video inspection of inside of service drain pipe to DPD if backfill occurs prior to inspection and testing.
3. Existing Stubs and Tees section; as above, provide video inspection of existing, inactive stub to DPD Site Inspector prior to finalizing the permit.
4. Pipe Lining and Pipe Bursting section; provide video inspection of public main to SPU after reline work for review and approval.

## **AA. Temporary Dewatering Permit**

1. A Side Sewer Permit for Temporary Dewatering on Construction Sites is required on sites greater than one acre in size and/or when there is collection and discharge of significant subsurface water during construction. See DPD Director's Rule 3-2004 and CAM 506 for more information.

## **VII. DRAINAGE DISCHARGE AND SERVICE DRAIN DETAILS**

### **A. Applicability**

The provisions of Section VII of this DR apply to service drains and the details associated with drainage discharges.

### **B. Service Drain Agreements**

1. A new or existing building may connect a new service drain to an existing side sewer or service drain serving one or more other parcels. This can only be done if the affected parties served by the existing side sewer or service drain execute with King

County a Connection, Hold Harmless, and Indemnification Agreement **prior** to issuance of the side sewer permit for service drains.

2. A new building located on a new lot of a short plat, that had, as part of the original lot, an existing connection and the existing connection has already been utilized by a lot of the short plat, may connect a new service drain to an existing side sewer or service drain serving one or more other parcels. This can only be done if the affected parties served by the existing side sewer or service drain execute with King County a Connection, Hold Harmless, and Indemnification Agreement **prior** to issuance of the side sewer permit for service drains.

3. A new or existing building may have their new service drain cross another property without making a connection to an existing side sewer or service drain serving one or more other parcels. This can only be done if the affected parties execute with King County an Easement, Hold Harmless, and Indemnification Agreement **prior** to issuance of the side sewer permit for service drains.

4. A new or existing building may be connected to an existing service drain serving one or more homes that in turn is connected to an over-sized private storm main serving multiple homes. A Connection, Hold Harmless, and Indemnification Agreement, required by DPD, must be executed with King County by the property owners of the existing service drain to allow the connection of the new service drain to said existing service drain **AND** to show that the original Side Sewer Easement and Connection Agreement for the over-sized private storm main allows for additional connection(s) in the future prior to issuance of the side sewer permit for service drains. Permittee shall provide the supporting documents to DPD including any recorded agreements for review and approval by DPD **prior** to issuance of the side sewer permit for service drains.

5. DPD will deny issuance of a side sewer permit for service drains when the proposal is for a new residence to connect to an existing side sewer or service drain located on the abutting property and there is an existing executed but **unrecorded** Easement and Connection agreement which is more than three (3) months old at the date of the application for a new side sewer permit for service drains from DPD.

### **C. Service Drain Connections**

#### **1. Private Catch Basins**

- a. A catch basin used with a storm drainage collection system shall be sized based upon the proposed catchment area for the basin and in accordance with the standards described in Section VII G of this DR.
- b. A catch basin is not required at the connection point between the downspout line and the service drain except as noted below.
- c. Drainage of parking lots 750 square feet or larger shall drain into catch basin(s) before the water drains into a combined sewer or storm main or other approved outlet. Catch basins located in parking lots shall require the installation of a downturned elbow on the outlet pipe from the catch basin.

- d. Drainage of parking lots having less than 750 square feet may connect to the roof service drain system or use a catch basin system.

## 2. Downspouts

- a. Downspouts can connect directly to a service drain that discharges into a combined sewer main via a combined side sewer provided that either the downstream service drain connects to a private catch basin or p-traps are installed on all the individual downspouts. The flow control device located within a stormwater detention system is not considered as an effective gas trap since the overflow device opens within the structure to the open air.
- b. The use of p-traps is allowed at **ALL** the downspout lines in lieu of a catch basin at the connection of the service drain to the side sewer. The p-trap(s) shall be located at the finish grade in order that they can be identified as p-traps.
- c. If no off-site discharge facility is available, downspouts may be allowed to discharge directly onto the grade (in lieu of discharging to a service drain) using a splash block and then into an infiltration facility (or equivalent such as biofiltration swale, pervious pavement, etc.) that has been engineered and constructed for said purposes. DPD may require the property owner to execute a Hold Harmless Agreement with King County as part of the Side Sewer Permit for Service Drains process if this type of system has been selected. SPU may approve additional exceptions as appropriate.
- d. In no case shall downspouts be connected directly to a subsurface footing collection system.
- e. A long 90 degree radius will be allowed to be installed at the most upstream downspout to act as a cleanout. Bury of the radius should be close to the ground with the top of the fitting flush with the finish grade.
- f. Drainage discharge from downspouts may be spilled onto a paved parking area only if the parking area drainage is collected by a private catch basin or if it sheet flows to a channelized alley which has an inlet structure at the downstream end of the alley, prior to intersecting the street or sidewalk.
- g. Downspouts may be connected to private catch basins only if the total area drained by the catch basin and roof drains does not exceed the catch basin capacities described in Table C, Catch Basin Service Areas..

## D. Redevelopment Standards

- 1. Drainage from redevelopment projects that exceed 750 square feet of new impervious area will be reviewed by DPD per the Drainage Control Review Requirements of Section 22.802.020 of the City's Drainage Code. The point of connection for service drains, whether to a public main or to an existing service drain or side sewer or through curb discharge, shall be approved by DPD using criteria and rules promulgated jointly by DPD and SPU.

2. Modification of existing infiltration systems or flow control facilities, including adding additional catch basins and piping or replacing the gravel bedding or backfill, will require a Side Sewer Permit for Service Drains.

3. Modification of existing downspouts to accommodate the addition of new downspouts due to building alterations and additions will require a Side Sewer Permit for Service Drains regardless of the area of the new impervious surface. See Section F.1.b and c, Permit Requirements.

## **E. Drainage Requirements**

1. Surface drainage collected from the Public Place will not be routed through private property unless that property is the natural drainage course or a public main (existing or to be constructed along with a City utility easement) is available.

2. All new and/or replaced impervious surface areas that are located in the Public Place will be included in the calculation for drainage requirements per the City's Stormwater and Drainage Code. These combined areas will be used to meet detention requirements for the entire development. The proposed development shall be reviewed by SPU, SDOT (if applicable), and DPD per existing drainage and side sewer code requirements.

3. Building over (Buildover) agreements must be secured from SPU prior to new construction. Applicant shall be responsible to check their legal documents for existing City utility easements in order to identify the existence of public structures that are located on private property.

## **F. Permit Requirements**

1. Per SMC 22.802.020 drainage review is required for any land disturbing activity encompassing an area of 750 square feet or more. However, if service drain work is associated with projects under this threshold, a Side Sewer Permit for Service Drains is still required for repair, alterations, and/or new construction of service drains including but not limited to conveyance pipes, catch basin connections, downspout connections, detention pipes, and subsurface drainage connections to an approved outlet. Service drains do not include groundwater collection systems upstream from the point of connection to the required catch basin.

2. Permits, connections per code, or agreements will not be required for the following, unless noted otherwise:

- a. Side Sewer Permit for Service Drains will not be required if the service drain is connecting to an existing on site infiltration system that has not been recorded by the City as a permitted facility.
- b. Service drains for new building additions less than 750 square feet may attach to an existing combined side sewer if the existing service drain system is connected to the existing side sewer AND there is no other option available to discharge the new roof drainage. A Side Sewer Permit for Service Drains will still be required for any work on service drains that connect to public infrastructure.

- c. Memorandum of Drainage Control (MDC) will not be required for new building additions or structures that are less than 750 square feet. However a Side Sewer Permit for Service Drains will be required for any work on service drains that connect to public infrastructure.
- 3. At DPD's discretion or at SPU's request, SPU review and comments may be required prior to issuing a Side Sewer Permit for Service Drains. This requirement may apply for situations such as, but not limited to, service drain connections to SPU facilities with known capacity restrictions or for building foundation footing drain connections.
- 3. Permits from other agencies or departments (such as Street Use or Utility Permits) are the responsibility of the permittee or property owner. There are specific penalties by departments such as SDOT for working without applicable permits.

#### **G. Standards for Catch Basins**

- 1. Private catch basins shall generally meet the standards under Sections 7-05 and 7-08 of the City's Standards Specifications. Catch basins, except as noted, shall meet or exceed the following minimum standards:
  - a. The outlet pipe shall be four-inch minimum diameter for catch basins serving areas up to 7,500 square feet. Refer to Table C, Catch Basin Service Areas. The outlet pipe shall be 6 inch minimum diameter for catch basins serving areas up to 15,000 square feet. Six inch connections are the minimum size for connection to City mains.
  - b. The trap for each catch basin collecting drainage from paved parking areas shall be constructed with a 90 degree elbow or tee (plugged at the top end) the same diameter as the outlet pipe, or as specified in the City of Seattle Standard Plans. The trap shall extend into the catch basin a minimum of 6" below the outlet invert. See the City's Standard Plan Numbers 242 and 267a.
  - c. A private catch basin collecting drainage from over 2,000 square feet of impervious surface area shall hold a minimum volume of approximately one-fourth cubic yard of waste material below the trap of the outlet (approximately 1-1/2 feet x 1-1/2 feet inside dimensions by 2 feet below the outlet trap).
  - d. A private catch basin collecting drainage from over 7,500 square feet of impervious surface area shall hold a minimum volume of approximately one-third cubic yard of waste material below the trap of the outlet (approximately 2 feet x 1-1/2 feet inside dimensions by 3 feet below the outlet trap).
  - e. A private inlet structure collecting drainage from under 2,000 square feet of non-traffic impervious surface area will not require a minimum volume of holding of waste below the trap of the outlet.
  - f. Catch basins may be constructed "on line" or "off line" to the service drain alignment.
  - g. Catch basins may be used for change in pipe alignment up to 90 degrees.

- h. If lawn or garden areas serving less than 500 square feet need drainage sumps, catch basins may be constructed of a 12 inch or larger diameter tongue and groove culvert pipe or equivalent with the bell end up (single pipe length) with a 6 inch base and a 4 inch elbow or tee with plug for a trap. If there is a concern of the catch basin being clogged by excess dirt, DPD may require the use of a larger type catch basin.
- i. Drain lines from catch basins and drain inlets that are located under cover, such as in a garage or carport, shall connect to the side sewer and not to the service drain.
- j. The maximum area served by a catch basin shall be determined according to the following Table. See also Exhibits 12 and 13 of this DR for examples.

**Table C, Catch Basin Service Areas**

Type of Catch Basin	Maximum Area Served	Status	Sump Required
Lawn and Garden Area Drain (Non Traffic)	500 square feet (w/4-inch outlet)	Private, non traffic areas	No
Private Inlet (Non Traffic)	2,000 square feet (w/4-inch outlet)	Private, non traffic areas	No
Private Catch Basin (Traffic)	4,000 square feet (w/4-inch outlet)	Private, traffic areas	Yes
Catch Basin Std Plan #241 (Traffic)	7,500 square feet (w/4-inch outlet)	Standard Plan	Yes
	15,000 square feet (w/6-inch outlet)	Standard Plan	Yes
Catch Basin Std Plan #240 (Traffic)	30,000 square feet (w/8-inch outlet)	Standard Plan	Yes
Private Catch Basin (Non Traffic or Traffic)	Not applicable	Private, used at connection of footing drain to service drain	Yes

- k. Washington State Department of Transportation (WSDOT)/American Public Works Association (APWA) Type I and Type II catch basins may be substituted for City designated Type 241a and Type 240 catch basins for private on-site drainage construction. See Exhibit 12 of this DR for catch basin examples.
- l. Hard-surfaced and graded areas shall be designed so that drainage will be collected on-site so as not to damage public or private property. Drainage collected from these areas should be discharged to a storm or combined

sewer main, weep hole at the curb, drainage ditch, or other approved outlet. Drainage shall not discharge to a sanitary sewer, unless it is determined by SPU (per Section 1.3 of the Drainage Code Flow Control Technical Requirements Manual) that:

- i. A sewer designated as "sanitary" in the SPU records was originally constructed as a combined sewer, and there is no other feasible alternative, or
- ii. The drainage water is of such likelihood to carry significant pollutants that it is determined by the Director of Seattle Public Utilities, with the concurrence of King County, that the drainage water shall be discharged to the sanitary sewer for pollution control purposes.

#### **H. Footing Drains and Subsurface Drainage Collection Systems**

1. Subsurface drainage collection systems may be connected to a service drain only if the discharge flows through a catch basin before entering the service drain. See Table C and Exhibit 12 of this DR.
2. Footing and other subsurface drains discharging through a catch basin and conveyance pipe may connect to a storm or combined sewer. A separate permit from King County may be required for connection to a public combined sewer. A separate release letter from SPU may be required for connection to a public storm main.
3. Footing drains shall be connected to the outlet of the flow control structure, and shall not discharge directly into a detention and flow control system.
4. Water collected by footing drains shall pass through a catch basin before discharge to a public system or watercourse (see Table C and Exhibit 12 of this DR). Use of a curb discharge will not be allowed for drainage collected from a footing drain system.
5. Sub surface flows originating from retaining walls including rockeries shall not be directed over any public sidewalk or Public Place.
6. The catch basin(s) used for the footing drain system may be placed within the building provided that the solid cover is water tight and also is inspected by the Seattle-King County plumbing inspector.
7. Footing drain discharge may be directed to an on-site infiltration pit (dry well). No other drainage may be directed to the pit unless the impervious area associated with this other drainage has been accounted for as part of the infiltration system design. See also Section VIII.L, Infiltration Facilities, of this DR and the Flow Control DR of the City's Drainage Code.
8. Inspection of the connection of footing drains to a service drain will be part of the Side Sewer Permit for Service Drains.
9. When using geotextile material refer to Geotextile for Underground Drainage, City of Seattle Standard Specifications 2005 edition Section 9-37.2 (Tables 1 & 2).

## **I. Service Drain Details**

1. Backwater valves, if selected by the permittee and located outside a building, shall be placed in a chamber so that each valve is readily accessible for maintenance. Backwater valves are not required under SMC 21.16, but are allowed by DPD if selected by the permittee.
2. Grafts are not allowed on service drains. Such connections shall be accomplished by installing a standard manufactured wye. Tees are not allowed in service drain construction, except for test ball access.
3. Backfill and restoration of public areas not in the traveled portion of a roadway shall be accomplished by a Registered Side Sewer Contractor and shall follow the requirements of the Standard Plans and Specifications and SDOT's Street and Sidewalk Restoration Rules.
4. Service drains shall not connect to a public sanitary sewer main even if the main converts to a public combined sewer main downstream.
5. A service drain from a detention flow control structure is allowed to discharge on site if there is no public combined sewer or storm drain, receiving water body, or Class A or Class B Riparian Corridor located in the immediate area (350 feet). Protection of the ground at the end of the pipe shall be provided including rip rap, dispersal device, or other approved method.

The means and methods for service drain discharge into an Environmentally Critical Area (ECA), slope, or abutting property shall be determined by a licensed civil engineer/geotechnical engineer. The location of the terminus of the service drain pipe shall be established such that it maintains the hydrology of a wetland or riparian corridor, if applicable. Discharge of service drains on Steep Slope ECAs will be allowed if the slopes are not located in a known ECA landslide area or potential landslide area and discharge shall be made with the use of a level spreader. A numerical stability analysis, bearing the engineer's stamp and signature, may be required by DPD to verify that the slope will remain stable when discharge of drainage flow is proposed.

6. Drain pipe under special conditions (in soil previously excavated and then backfilled with less than minimum cover or with greater than the maximum slope normally permitted by DPD) shall consist of either solvent-welded Schedule 40 or 80 PVC or ductile iron pipe with restrained joints. See the Pipe Slope and Pipe Cover Sections of this DR.

## **J. Work within Public Place**

1. Where a public storm main exists, all drainage shall be directed to the main. Service drains shall be connected directly to the storm main or other public drainage control system unless otherwise approved by DPD or SPU (e.g. curb discharge) per the conditions and requirements of this DR, the City's Drainage Code, its accompanying DRs, and any other applicable City rules and regulations.
2. Where a public combined sewer main exists, and no public drainage control system exists, all drainage shall be directed to the main. Service drains shall be connected directly to the combined sewer main via a combined side sewer or service

drain unless otherwise approved by DPD or SPU. See Exhibit 6 for details on connection requirements in combined sewer areas. Curb discharge may be required or allowed depending on site conditions and the accessibility of available utilities.

3. A junction box per standard plan number 277 is required when a connection from a service drain is proposed to connect to a culvert (previously a ditch) located in the Public Place. The junction box and connection shall be inspected by SPU prior to cover.

## **K. Curb Discharge into the Public Place**

1. Curb discharge of drainage discharges from developments may be allowed based on the following conditions:

- The site is a small project (projects with less than 5,000 square feet of new and replaced impervious surface or less than one acre of disturbed area) and the available public drainage infrastructure is on the far side (other side of street centerline) from the site.
- drainage from that discharge point remains in the gutter line all the way to the nearest inlet structure,
- the discharge doesn't originate from a footing drain system,
- the discharge enters an inlet before or at the next downstream intersection (unimproved intersections are considered by the City to be "fully improved" for this requirement),
- the inlet is not located more than 350 feet downstream of the curb discharge point,
- the inlet discharges to a storm drainage system, the existing (or rebuilt street curb) is high enough to preclude flowing water from leaving the gutter line,
- discharges do not encroach on the travel lane,
- and the downstream inlet has been deemed adequate and proper to intercept said drainage flows.

Curb discharge will be at the discretion of the DPD reviewer (in consultation with SPU as needed) based on site conditions, requirements of this DR, and available drainage/public infrastructure. Also see additional restrictions under this section.

2. **Curb Discharge Restriction:** Curb discharge will not be allowed if a storm main or culvert is located in the Public Place which the project has street frontage on. Direct connection to the main or other storm conveyance system will be required for projects with service drains, even if the storm main or culvert is located on the other side of the street centerline (i.e. far side connections). As stated above, small projects (projects with less than 5,000 square feet of new and replaced impervious surface or less than one acre of disturbed area) may not be required to make a direct connection if it necessitates a far side connection to a public drainage system. Detention or pump systems may still apply depending on development conditions and available infrastructure.

3. Prior to installing a curb discharge system, a Side Sewer Permit for Service Drains shall be obtained from DPD. A Registered Side Sewer Contractor is the only contractor allowed to construct the curb discharge systems if these facilities are located in the Public Place.

4. DPD and SPU may allow discharge to occur in the alley if drainage from that discharge point flows to the alley gutter line, the alley has concrete or asphalt paving, and there is a City inlet located at the terminus of the alley to allow alley drainage flows to discharge into the street or into a drainage system without surface-crossing the sidewalk.

5. Alley discharge shall not be allowed if any one of the requirements as noted above is **NOT** present.

6. The use of "bubblers," "energy dissipater boxes," and riprap are allowed as part of the alley discharge drainage system provided these facilities are located on private property.

7. In cases where curb discharge is approved, the discharge pipe constructed through the curb may be less than 6 inches in diameter, depending on curb height and proposed flows, even though this pipe is located within the Public Place. See Exhibit 18 of this DR and Standard Plan 241B for examples.

**Table D, Curb Face and Pipe Discharge Schedule**

Exist Curb Height (Inches)	On Site Pipe Dia (Inches)	Curb Face Pipe Dia (Inches)	No. of Pipes (Each)	Width (W)	Area (SF)	New Curb Height (Inches)	Exhibit No.
6	4	4	1	---	0.09	---	---
6	6	4	2	---	0.17	---	---
5	4	3	1	---	0.05	---	---
5	6	3	2	---	0.10	---	---
4	4	---	---	4	0.11	---	17
4	6	---	---	4	0.11	---	17
3	4	---	---	4	0.11	---	17
3	6	---	---	4	0.11	---	17

8. When the existing curb height is less than five (5) inches in height and the project is located in a residential, commercial or industrial area, the RSSC shall contact the SDOT Inspector to obtain approval for the reconstruction of the existing curb and provide a new curb discharge piping system using either Exhibit 17, Concrete Culvert

with Plate or Exhibit 18, Pipe Culverts. Curb discharge will not be allowed for existing curbs less than 3-inches in height.

9. Curb discharge of subsurface flows originating from building footing drains will not be allowed.
10. Curb discharge via a weephole shall not be permitted on the high side of a street when the street cross section is a "thrown street".
11. Curb discharge through an existing curb which is brick, granite, or other special and/or decorative material must be arranged through SDOT's Street Use Division prior to permitting or construction.
12. Curb discharge may be allowed for temporary discharge of collected construction drainage provided a Side Sewer Permit for Temporary Dewatering has been processed by DPD or it is approved as part of the project's TESC plan.

#### **L. Infiltration Facilities**

1. The following is the clarification for the procedure for design of infiltration systems as per Chapter 3 of Director's Rule 26-2000 DPD/03-00 SPU. Note that pre-treatment may be required for addressing water quality when infiltrating:
  - a. The licensed geotechnical engineer or certified septic designer may use the "Simple Soil Test Method" to establish the infiltration rate per Section 3.6
  - b. Adjust the rate using the "corrected" factor of 1.2, per Section 3.10, Table 11 (i.e. 2.4 in/hr soil infiltration rate = 2.00 in/hr corrected infiltration rate for design)
  - c. Establish the impervious area
  - d. Design the infiltration trench
  - e. Dry wells may be allowed if the "corrected" rate is less than 4 in/hr
2. Infiltration facilities may be prohibited if connection to a combined sewer or storm main is accessible.
3. Infiltration facilities may be prohibited if curb discharge is accessible and satisfies the curb discharge requirements of this rule.
4. Infiltration trenches are preferred over dry wells.
5. The maximum impervious surface per dry well is 1,000 square feet. Additional dry wells are required for areas exceeding 1,000 square feet impervious area.
6. Alternate dry well/pit/facilities can be submitted to DPD and SPU for review and approval.
7. A retention system, per Exhibit 20, may be utilized in lieu of infiltration pit or trench.

#### **M. Stormwater Detention Planters**

1. Planters used for stormwater detention shall comply with Section 2.3 of Director's Rule 26-2000 DPD/03-00 SPU and as clarified in this Section.

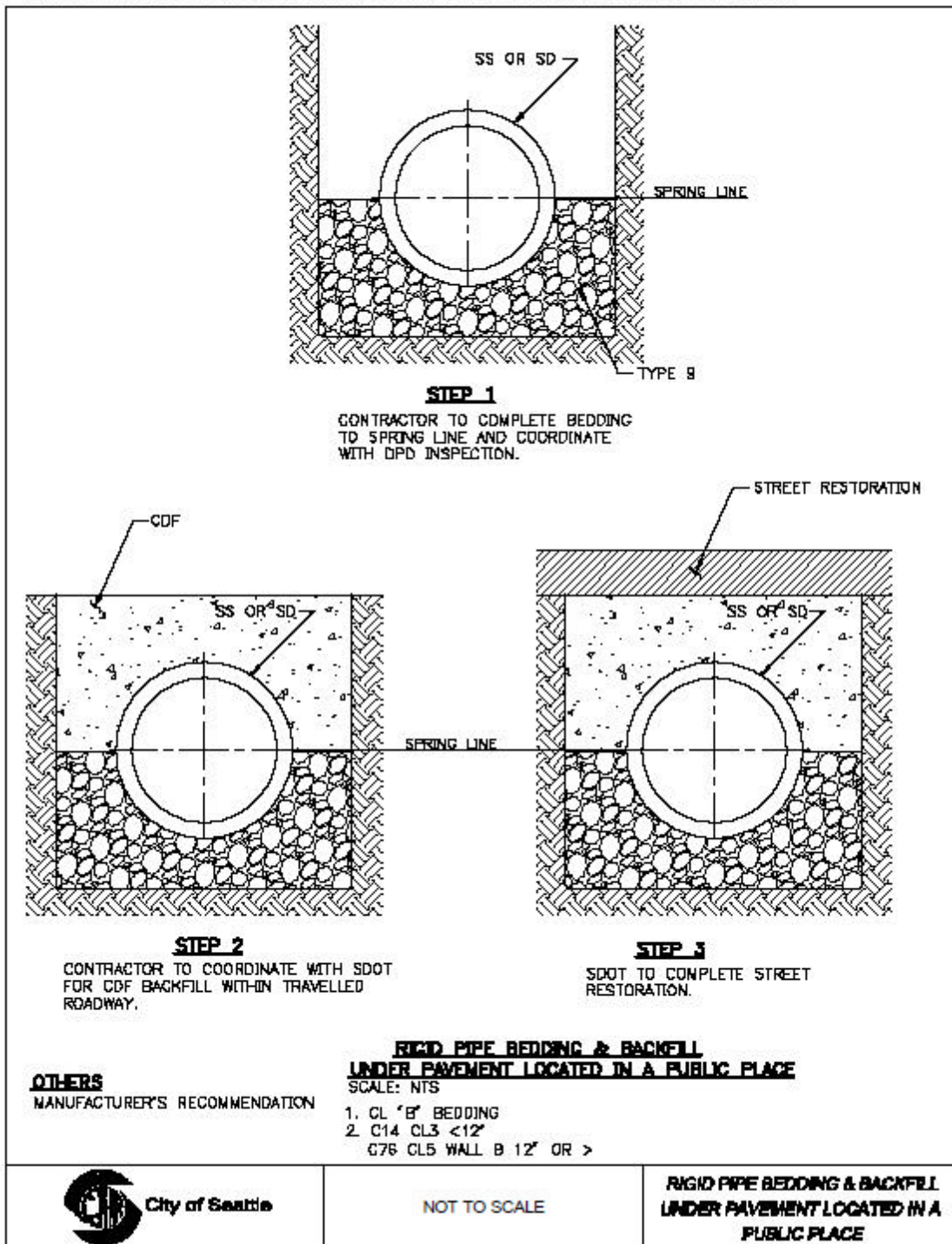
2. Perforated pipe shall extend the entire length of the planter.
3. Filter fabric shall be installed to separate the loamy sand topsoil layer from the pea gravel layer (To obtain geotextile classification, use Geotextile for Underground Drainage, City of Seattle Standard Specifications, Section 9-37.2 (Tables 1 & 2).
4. The inlet of the overflow pipe shall be at least 12 inches above the finished grade of the loamy sand topsoil layer.

#### **N. Rain Barrels**

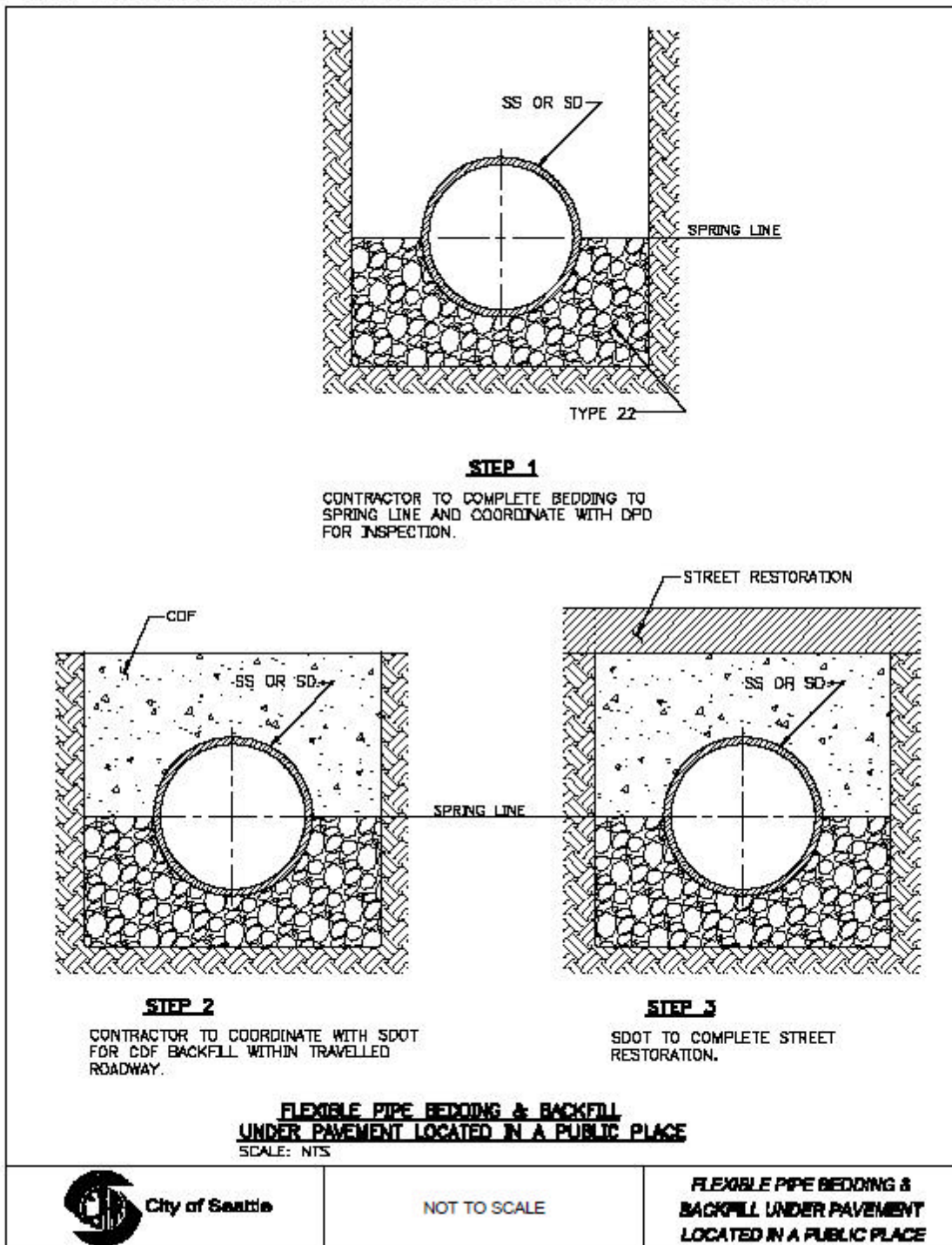
Rain barrels may be allowed to catch and save rainwater using the building downspouts. Specifications for rain barrels should include the following:

- a. Use a tight-fitting, light-blocking lid to keep children and animals out of the water and stop the development of algae.
- b. Add a screen to keep leaves and other debris out of the water.
- c. Use an overflow device to direct excess water from the rain barrel back to the downspout service drain line.
- d. Rain barrels will not be considered as a credit for Flow Control.

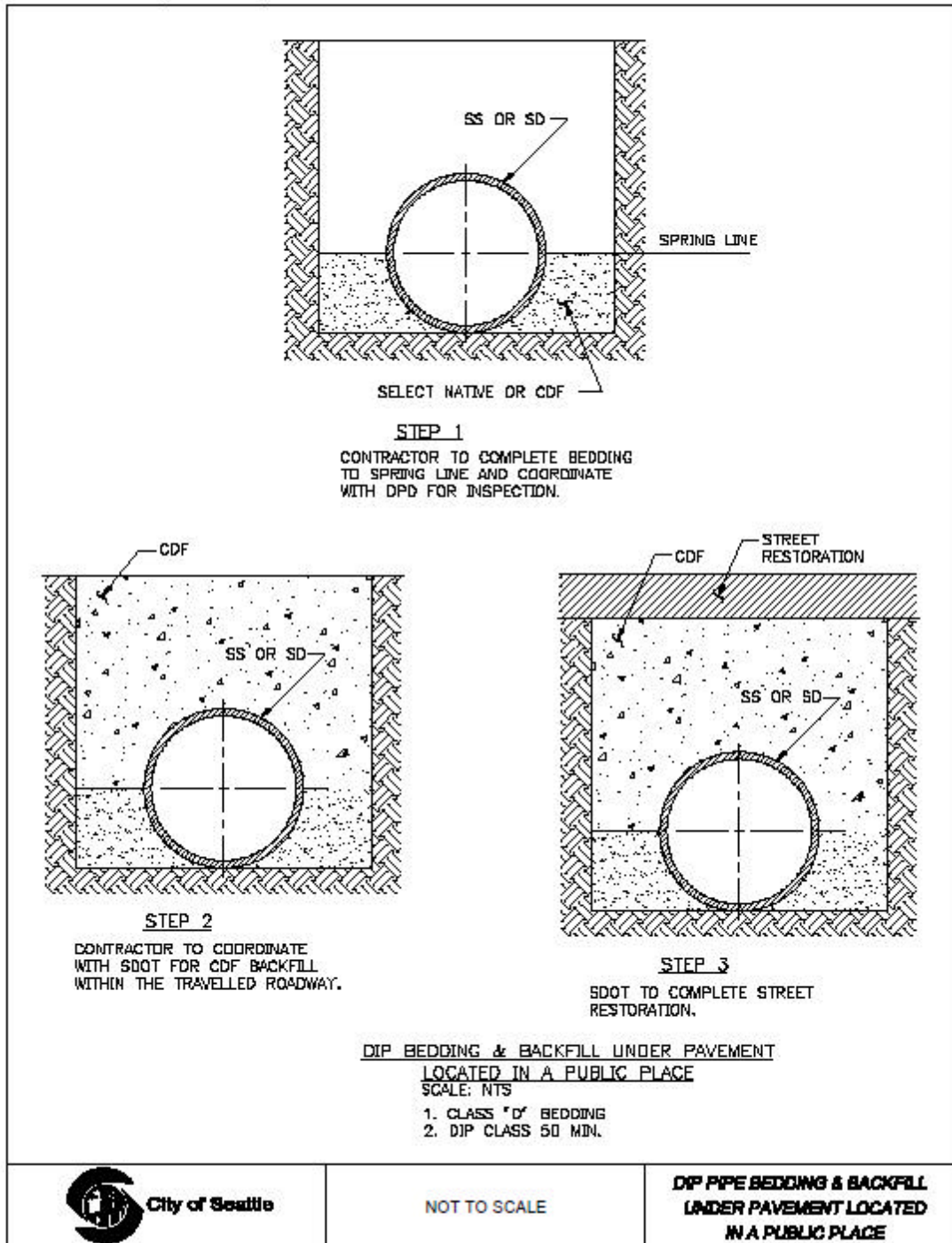
**Exhibit 1. Rigid Pipe Bedding & Backfill Under Pavement Located in A Public Place**



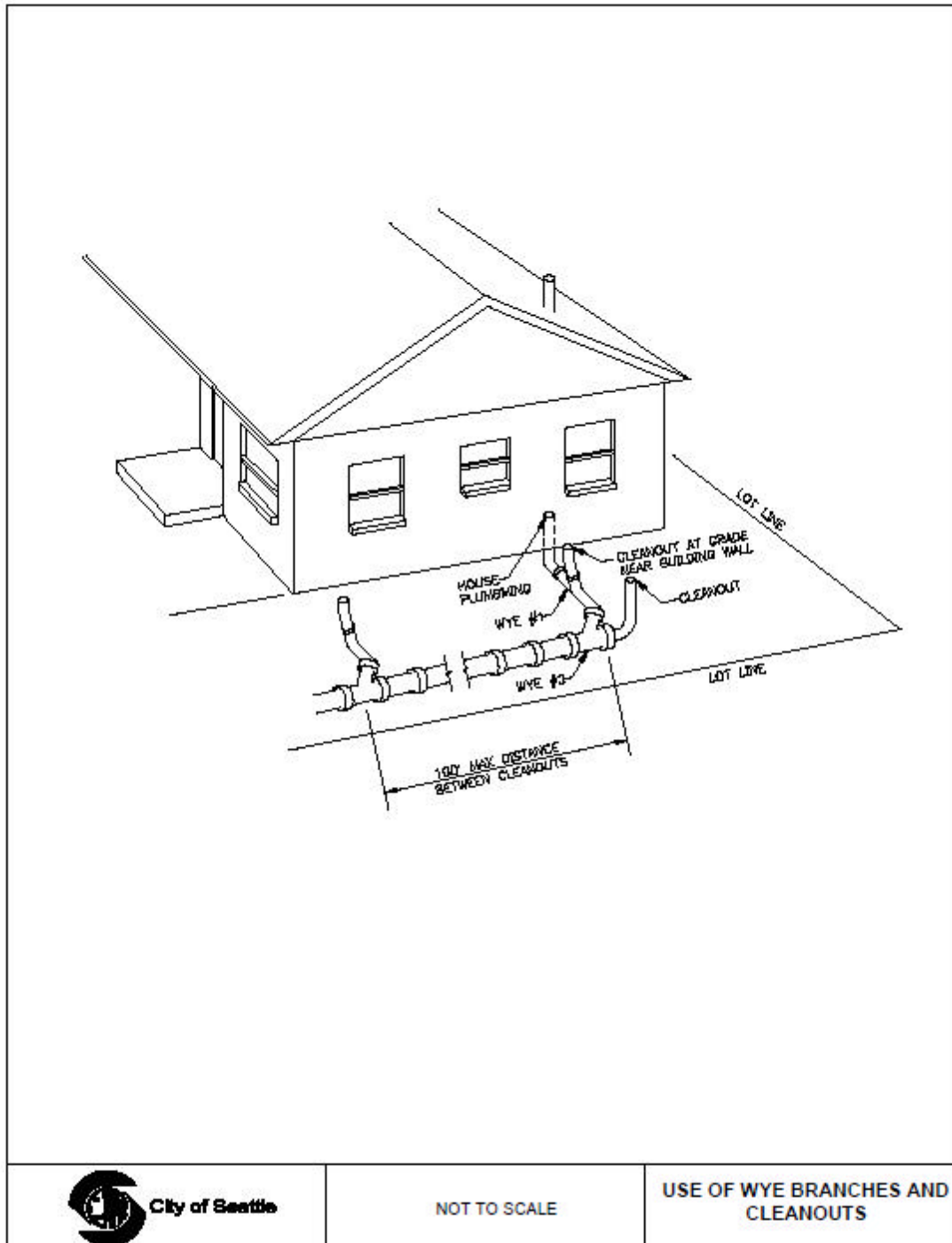
**Exhibit 2. Flexible Pipe Bedding & Backfill Under Pavement Located In A Public Place**



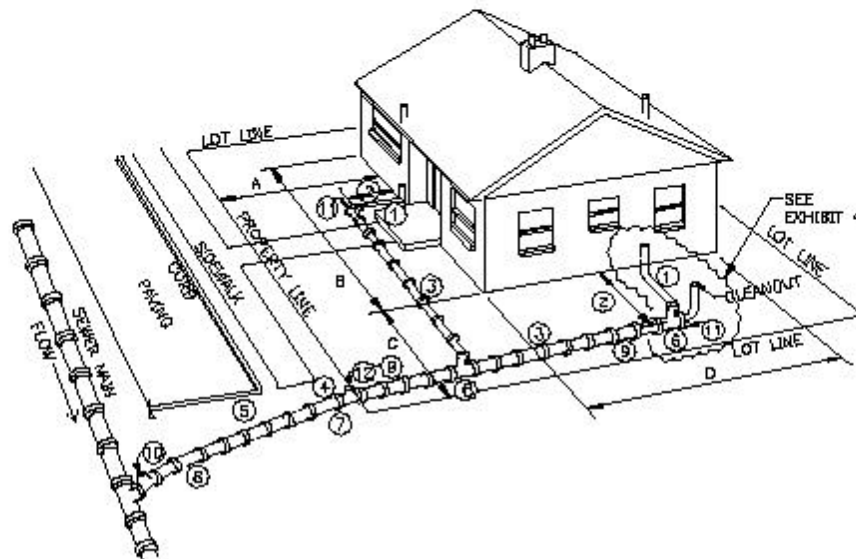
**Exhibit 3. DIP Pipe Bedding & Backfill Under Pavement Located In A Public Place**



*Exhibit 4. Use of Wye Branches and Cleanouts*



**Exhibit 5. Side Sewer Installation Based On Standard Plan No. 283**



**NOTES:**

1. ALL HOUSE PLUMBING OUTLETS MUST BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED, EXCEPT TO A SEPARATE STORM DRAINAGE SYSTEM.
2. 2'-8" MIN DISTANCE FROM HOUSE, EXCEPT FOR SOIL PIPE CONNECTION.
3. 1'-8" MIN COVER OF PIPE.
4. 2'-8" MIN COVER AT PROPERTY LINE.
5. 9'-0" MIN COVER AT CURB LINE.
6. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH BENDS OR WYES.
7. STANDARD 4" TO 8" INCREASER.
8. 6" SEWER PIPE: MIN SIZE IN STREET, AND ELSEWHERE AS DIRECTED. 2% MIN GRADE, 100% MAX.
9. 4" SEWER PIPE: MIN SIZE ON PROPERTY. 2% MIN GRADE, 100% (45") MAX.
10. TEST "T" WITH PLUG.
11. REMOVABLE PLUG OR CLEANOUT.
12. TEST "T" WITH PLUG AT UPSTREAM SIDE OF SIDE SEWER AS REQUIRED.
13. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE. COMPLETE LEGAL DESCRIPTIONS OF PROPERTY AND DIMENSIONS A, B, C AND D THAT SHOW THE SIZE AND LOCATION OF THE HOUSE ARE REQUIRED FOR ISSUANCE OF THE PERMIT.
14. CONSTRUCTION IN PUBLIC PLACE MUST BE DONE BY A REGISTERED SIDE SEWER CONTRACTOR.
15. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SIDE SEWER ORDINANCES.
16. ORDINANCE 97018 APPLIES TO INSTALLATION OF SIDE SEWERS.

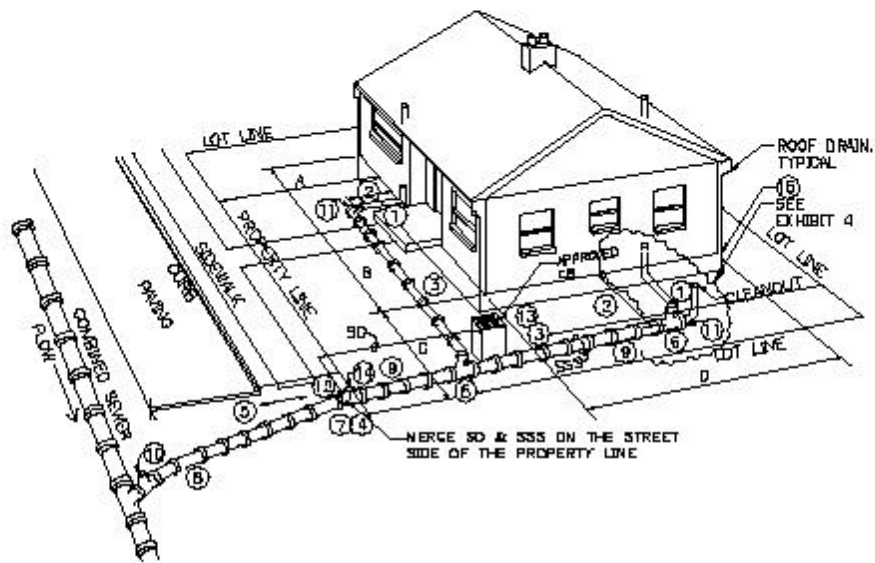


**City of Seattle**

NOT TO SCALE

**SIDE SEWER  
 INSTALLATION BASED ON  
 STANDARD PLAN NO. 283**

**Exhibit 6. Side Sewer & Service Drain Connection To A Combined Sewer System**



**NOTES:**

1. ALL HOUSE PLUMBING OUTLETS MUST BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED, EXCEPT TO A SEPARATE STORM DRAINAGE SYSTEM.
2. 2'-0" MIN DISTANCE FROM HOUSE, EXCEPT FOR SOIL PIPE CONNECTION.
3. 1'-0" MIN COVER OF PIPE.
4. 2'-0" MIN COVER AT PROPERTY LINE.
5. 5'-0" MIN COVER AT CURB LINE.
6. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH BENDS OR WYES.
7. STANDARD 4" TO 6" INCREASER.
8. 6" SEWER PIPE: MIN SIZE IN STREET, AND ELSEWHERE AS DIRECTED. 2% MIN GRADE, 100% MAX.
9. 4" SEWER PIPE: MIN SIZE ON PROPERTY. 2% MIN GRADE, 100% (45") MAX.
10. TEST "T" WITH PLUG.
11. REMOVABLE PLUG OR CLEANOUT.
12. CONNECTION TO SIDE SEWER REQUIRES SIDE SEWER TO BE 6".
13. TYPE 50 GATCH BASIN OR P-TRAP AT EACH DOWNSPOUT.
14. TEST "T" WITH PLUG AT UPSTREAM SIDE OF SIDE SEWER AS REQUIRED.
15. P-TRAP AT ALL DOWNSPOUTS IF GB IS NOT USED.
16. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE. COMPLETE LEGAL DESCRIPTIONS OF PROPERTY AND DIMENSIONS A, B, C AND D THAT SHOW THE SIZE AND LOCATION OF THE HOUSE ARE REQUIRED FOR ISSUANCE OF THE PERMIT.
17. CONSTRUCTION IN PUBLIC PLACE MUST BE DONE BY A REGISTERED SIDE SEWER CONTRACTOR.
18. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SIDE SEWER ORDINANCES.
19. ORDINANCE 97010 APPLIES TO INSTALLATION OF SIDE SEWERS.

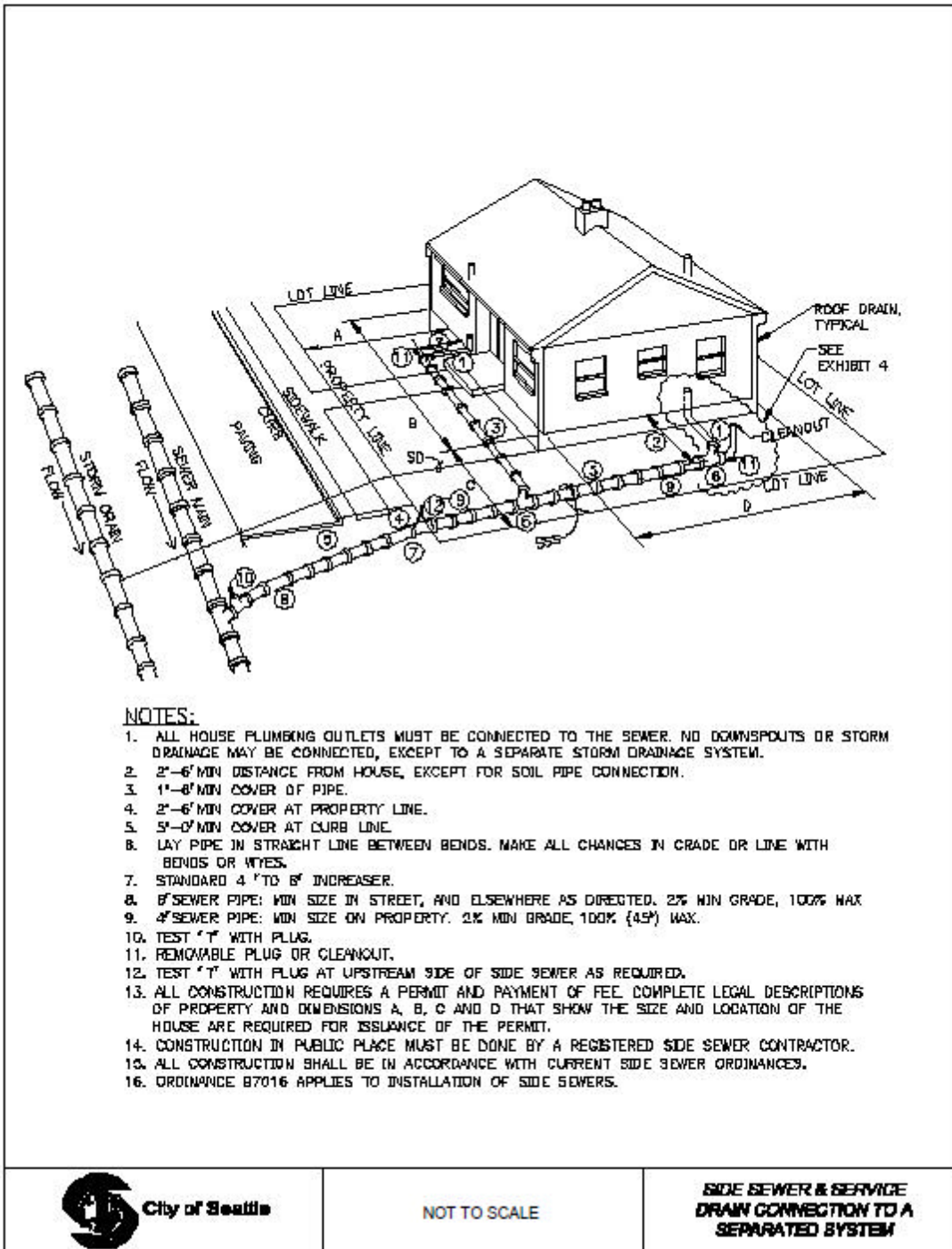


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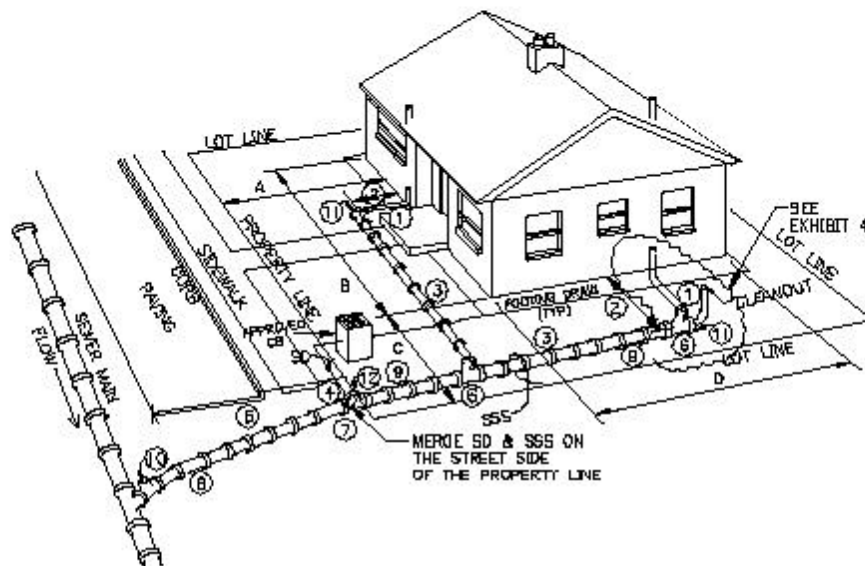
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**SIDE SEWER & SERVICE DRAIN  
 CONNECTION TO A  
 COMBINED SEWER SYSTEM**

**Exhibit 7. Side Sewer & Service Drain Connection To A Separated System**



**Exhibit A. Footing Drain Connection To Private Catch Basin Prior To Discharge Into Combined Sewer**



**NOTES:**

1. ALL HOUSE PLUMBING OUTLETS MUST BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED, EXCEPT TO A SEPARATE STORM DRAINAGE SYSTEM.
2. 2'-8" MIN DISTANCE FROM HOUSE, EXCEPT FOR SOIL PIPE CONNECTION.
3. 1'-6" MIN COVER OF PIPE.
4. 2'-8" MIN COVER AT PROPERTY LINE.
5. 5'-0" MIN COVER AT CURB LINE.
6. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH BENDS OR WYES.
7. STANDARD 4" TO 6" INCREASER.
8. 8" SEWER PIPE: MIN SIZE IN STREET, AND ELSEWHERE AS DIRECTED. 2% MIN GRADE, 100% MAX.
9. 4" SEWER PIPE: MIN SIZE ON PROPERTY. 2% MIN GRADE, 100% (45°) MAX.
10. TEST "T" WITH PLUG.
11. REMOVABLE PLUG OR CLEANOUT.
12. TEST "T" WITH PLUG AT UPSTREAM SIDE OF SIDE SEWER AS REQUIRED.
13. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE. COMPLETE LEGAL DESCRIPTIONS OF PROPERTY AND DIMENSIONS A, B, C AND D THAT SHOW THE SIZE AND LOCATION OF THE HOUSE ARE REQUIRED FOR ISSUANCE OF THE PERMIT.
14. CONSTRUCTION IN PUBLIC PLACE MUST BE DONE BY A REGISTERED SIDE SEWER CONTRACTOR.
15. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SIDE SEWER ORDINANCES.
16. ORDINANCE 97018 APPLIES TO INSTALLATION OF SIDE SEWERS.

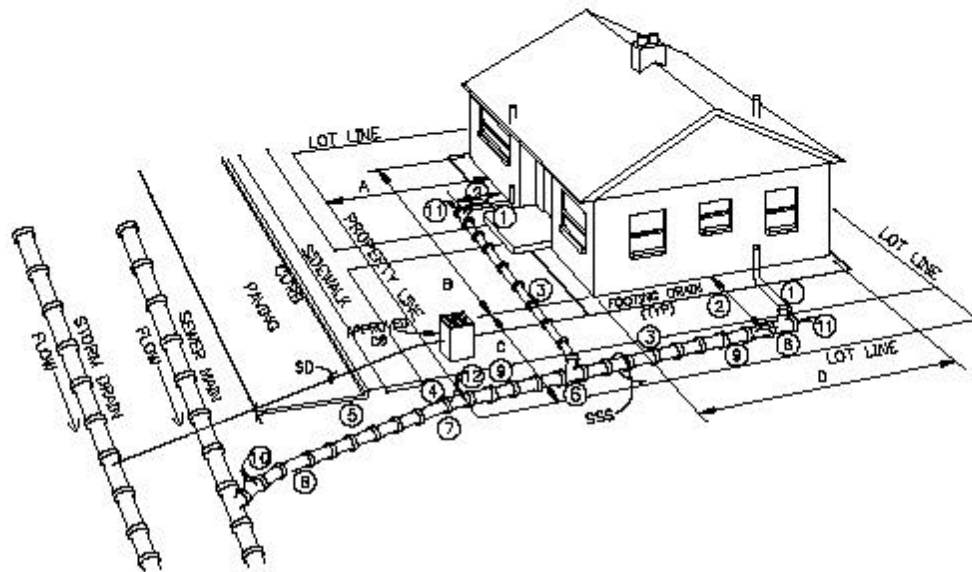


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NOT TO SCALE

**FOOTING DRAIN CONNECTION TO  
 PRIVATE CATCH BASIN PRIOR TO  
 DISCHARGE INTO COMBINED SEWER SYSTEM**

**Exhibit 9. Footing Drain Connection To Private Catch Basin Prior To Discharge Into Storm Drain System**



**NOTES:**

1. ALL HOUSE PLUMBING OUTLETS MUST BE CONNECTED TO THE SEWER. NO DOWNSPOUTS OR STORM DRAINAGE MAY BE CONNECTED, EXCEPT TO A SEPARATE STORM DRAINAGE SYSTEM.
2. 2'-6" MIN DISTANCE FROM HOUSE, EXCEPT FOR SOIL PIPE CONNECTION.
3. 1'-6" MIN COVER OF PIPE.
4. 2'-6" MIN COVER AT PROPERTY LINE.
5. 6'-0" MIN COVER AT CURB LINE.
6. LAY PIPE IN STRAIGHT LINE BETWEEN BENDS. MAKE ALL CHANGES IN GRADE OR LINE WITH BENDS OR WYES.
7. STANDARD 4" TO 6" INCREASER.
8. 8" SEWER PIPE: MIN SIZE IN STREET, AND ELSEWHERE AS DIRECTED. 2% MIN GRADE, 100% MAX.
9. 4" SEWER PIPE: MIN SIZE ON PROPERTY. 2% MIN GRADE, 100% (45°) MAX.
10. TEST "T" WITH PLUG.
11. REMOVABLE PLUG.
12. TEST "T" WITH PLUG AT UPSTREAM SIDE OF SIDE SEWER AS REQUIRED.
13. ALL CONSTRUCTION REQUIRES A PERMIT AND PAYMENT OF FEE. COMPLETE LEGAL DESCRIPTIONS OF PROPERTY AND DIMENSIONS A, B, C AND D THAT SHOW THE SIZE AND LOCATION OF THE HOUSE ARE REQUIRED FOR ISSUANCE OF THE PERMIT.
14. CONSTRUCTION IN PUBLIC PLACE MUST BE DONE BY A REGISTERED SIDE SEWER CONTRACTOR.
15. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT SIDE SEWER ORDINANCES.
16. ORDINANCE 87018 APPLIES TO INSTALLATION OF SIDE SEWERS.

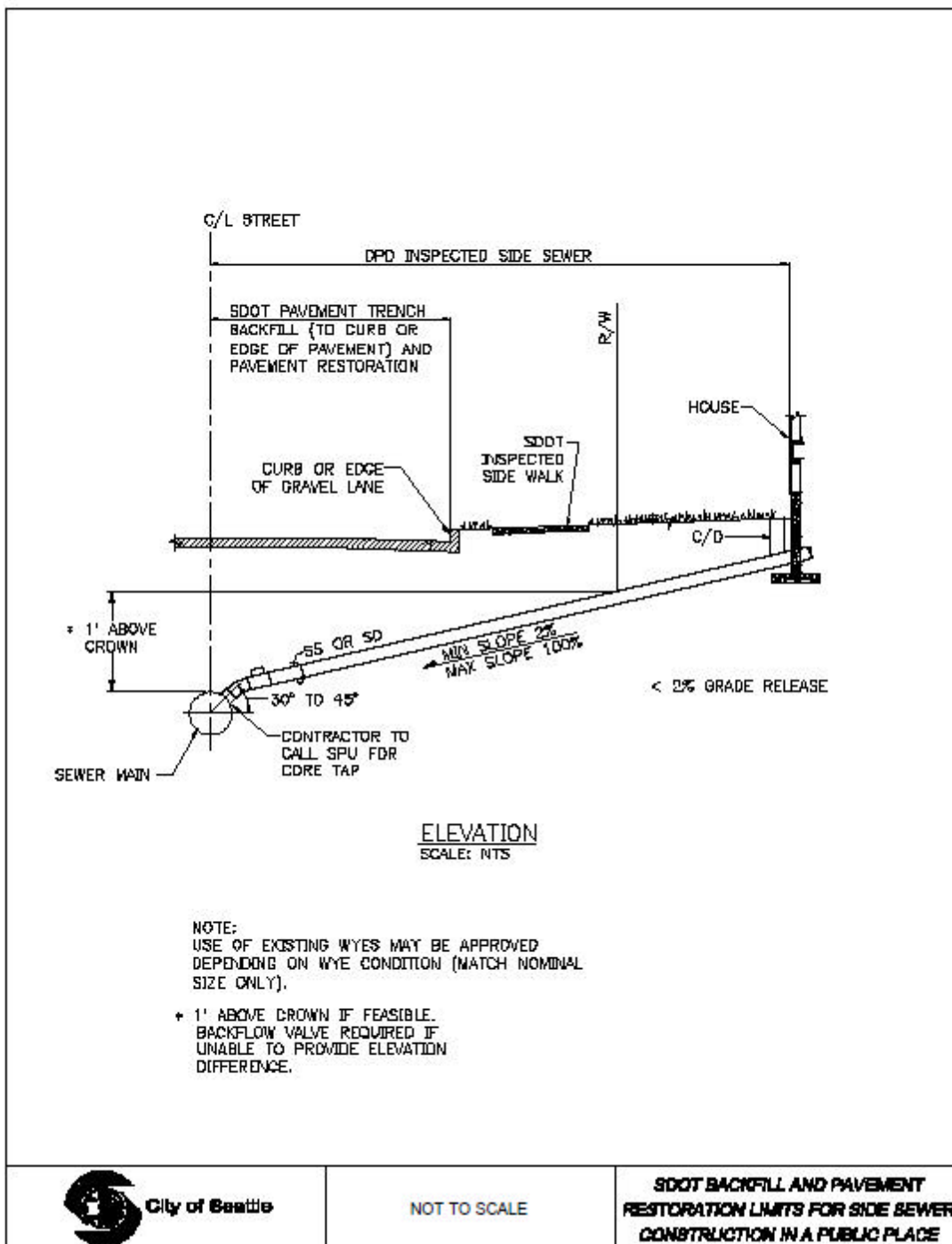


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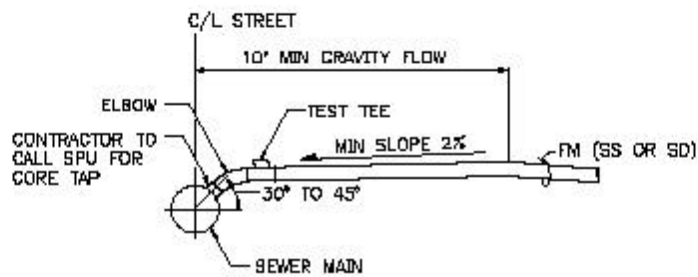
NOT TO SCALE

**FOOTING DRAIN CONNECTION TO  
 PRIVATE CATCH BASIN PRIOR TO  
 DISCHARGE INTO STORM DRAIN SYSTEM**

**Exhibit 10. SDOT Backfill And Pavement Restoration Limits  
 For Side Sewer Construction In A Public Place**



**Exhibit 11. Force Main Connection Including Last 10 LF Gravity Side Sewer**



ELEVATION  
SCALE: NTS

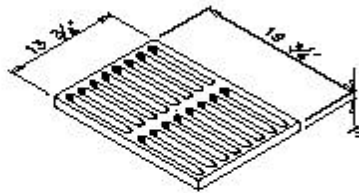


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NOT TO SCALE

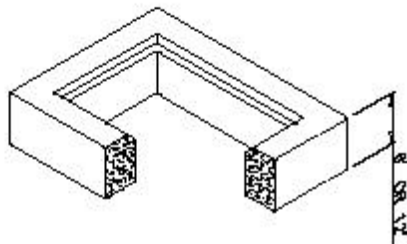
**FORCE MAIN CONNECTION  
INCLUDING LAST 10 LF  
GRAVITY SIDE SEWER**

**Exhibit 12. Private Catch Basin (W/ Steel Reinforcing)**



**Top Unit**

AVAILABLE WITH FRAME CAST INTO 6\"/>

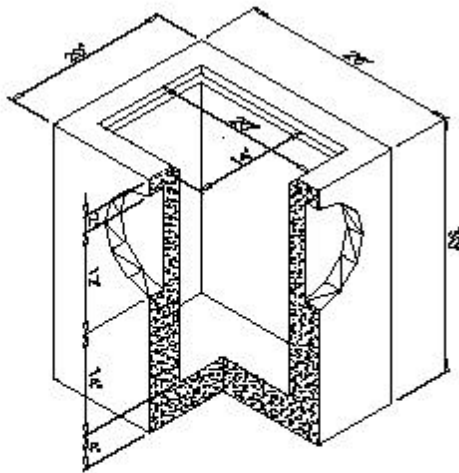


**Base Section**

KNOCKOUTS ARE PROVIDED FOR 6\"/>

BASE IS DESIGNED FOR USING THE GRATE WITH OR WITHOUT THE FRAME.

ALL CONCRETE IS 4,000 PSI MIN.

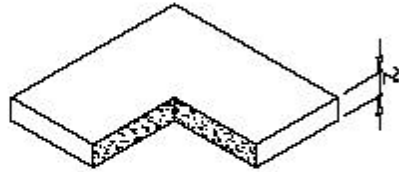


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NOT TO SCALE

**PRIVATE CATCH BASIN  
 (W/ STEEL REINFORCING)**

**Exhibit 13. Private Inlet (W/O Steel Reinforcing)**

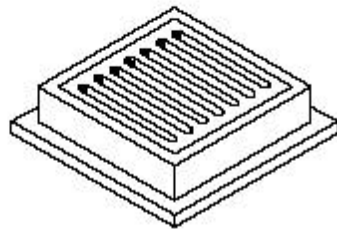


**Top Unit**

A SOLID CONCRETE COVER FOR USE AS A DISTRIBUTE BOX.

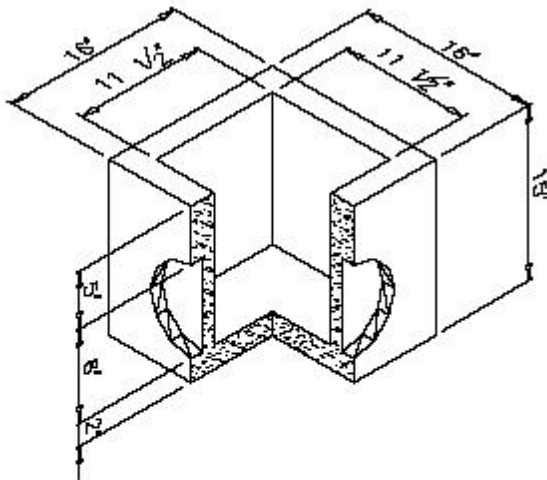
MATERIAL FRAME AND GRATE ARE DESIGNED FOR USE IN A SMALL CATCH BASIN WHEREVER A LIGHT GRATE IS NEEDED.

NON TRAFFIC RATED.



**Base Section**

FOUR KNOCKOUT HOLES ARE PROVIDED ON EACH SIDE TO ACCOMMODATE 4" DIAMETER PIPE.

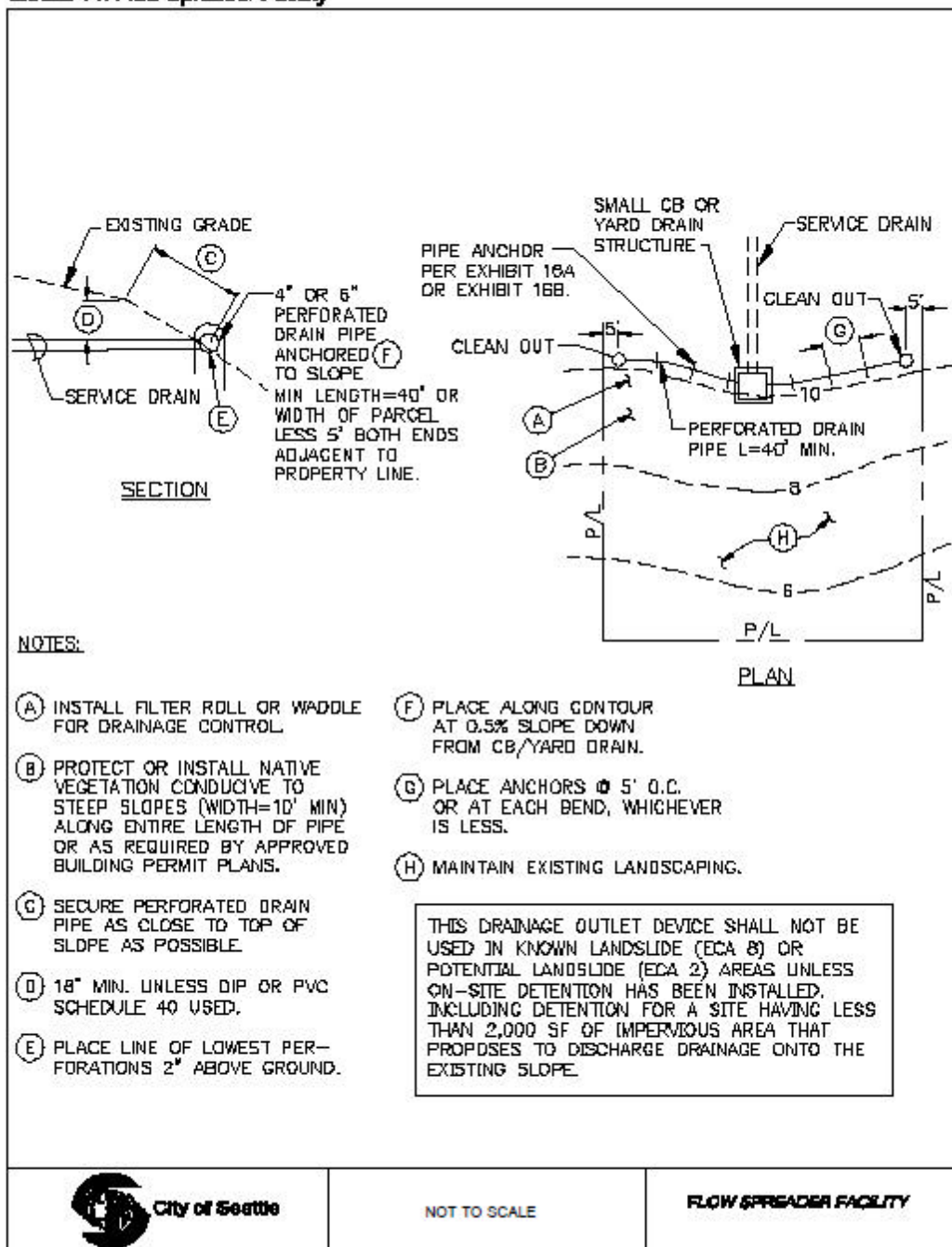


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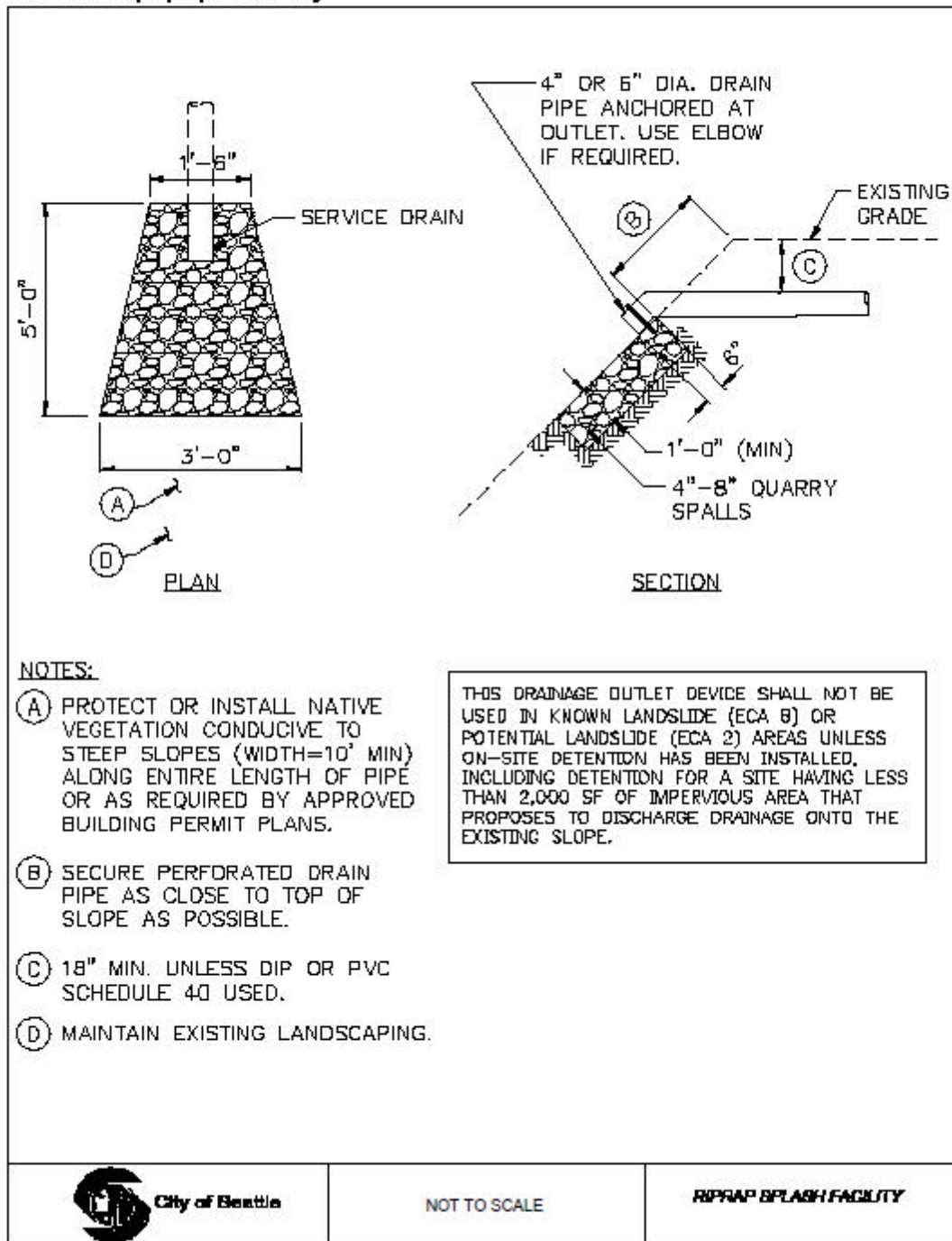
NOT TO SCALE

**PRIVATE INLET  
 (W/O STEEL REINFORCING)**

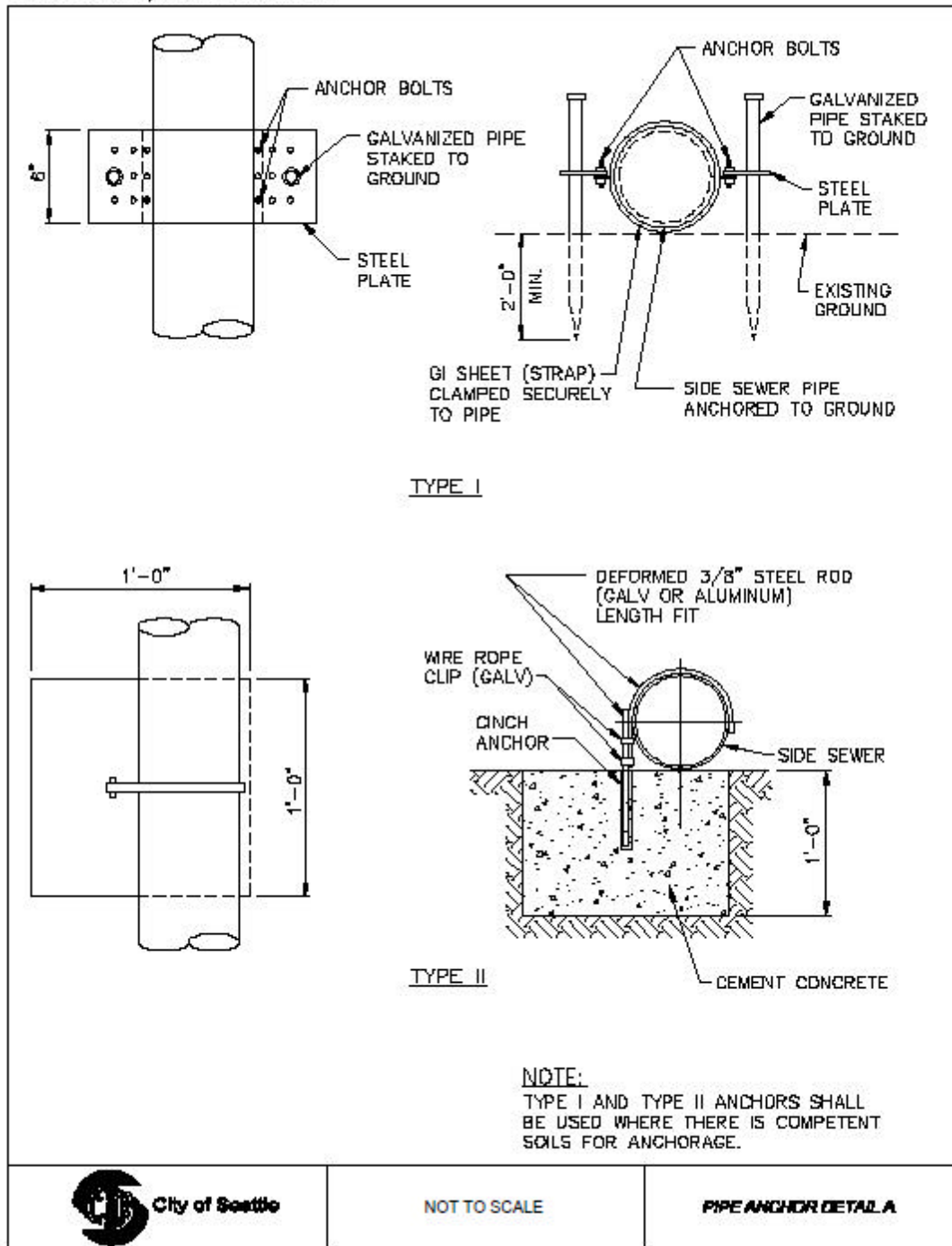
**Exhibit 14. Flow Spreader Facility**



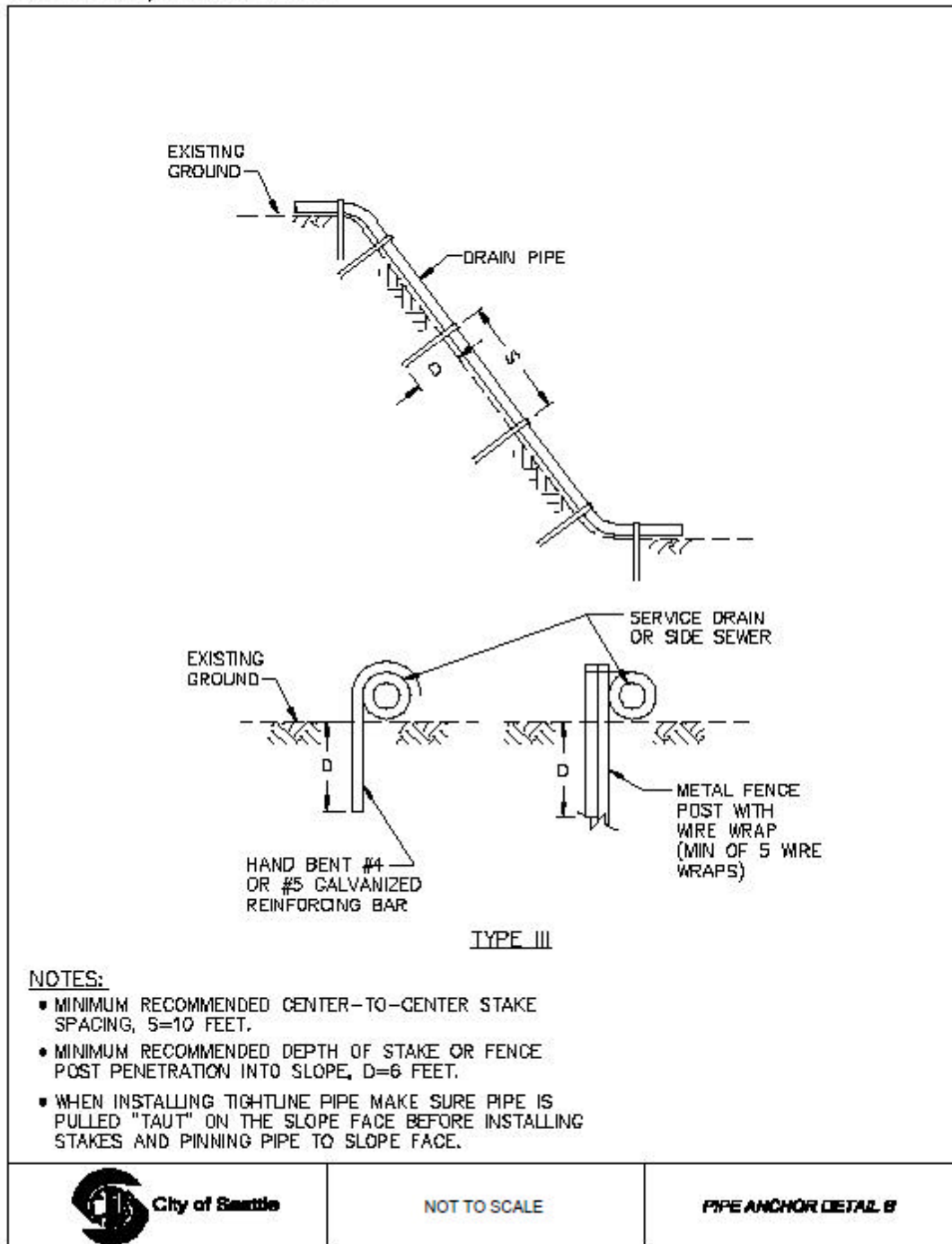
**Exhibit 16. Riprap Splash Facility**



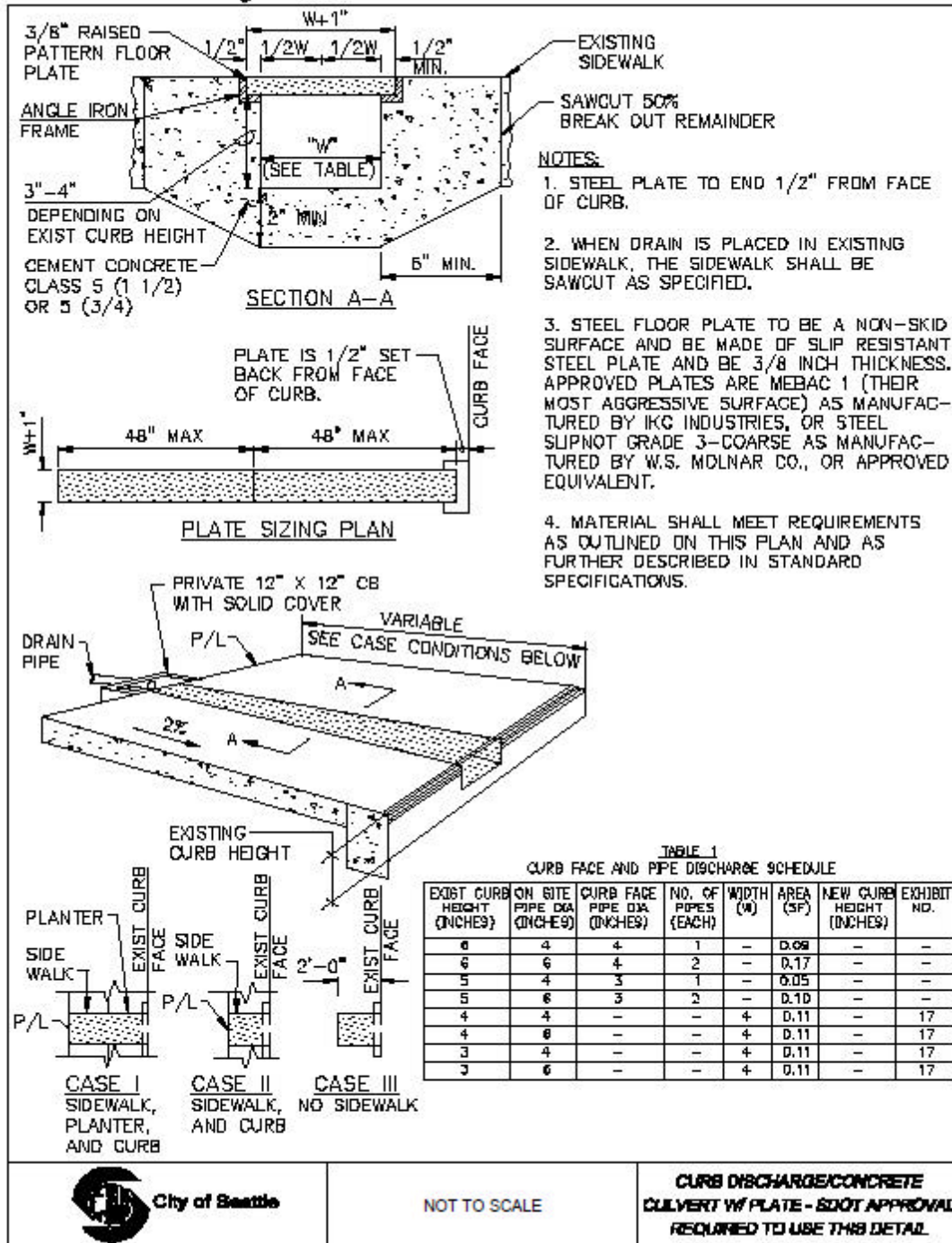
**Exhibit 18A. Pipe Anchor Detail A**



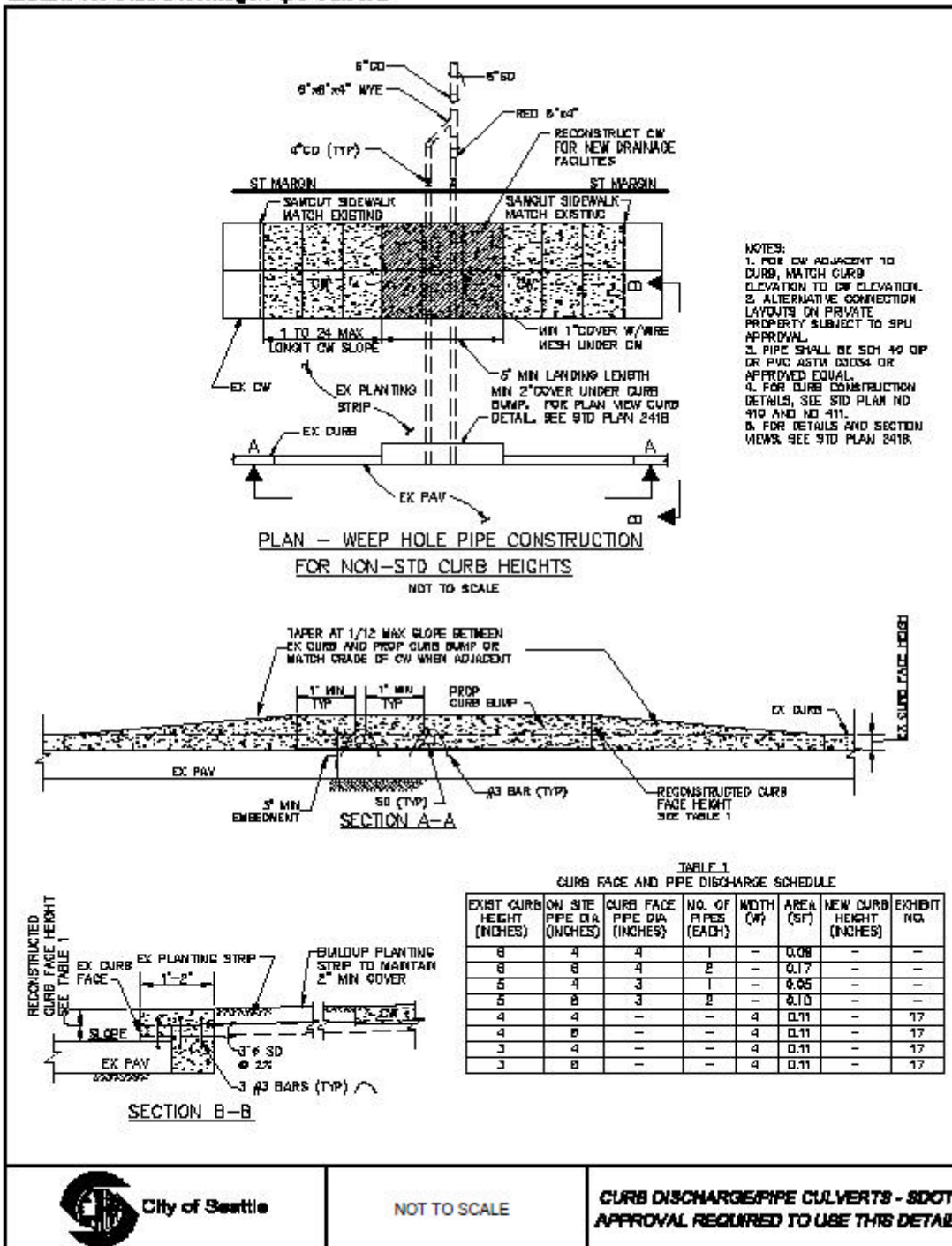
**Exhibit 16B. Pipe Anchor Detail B**



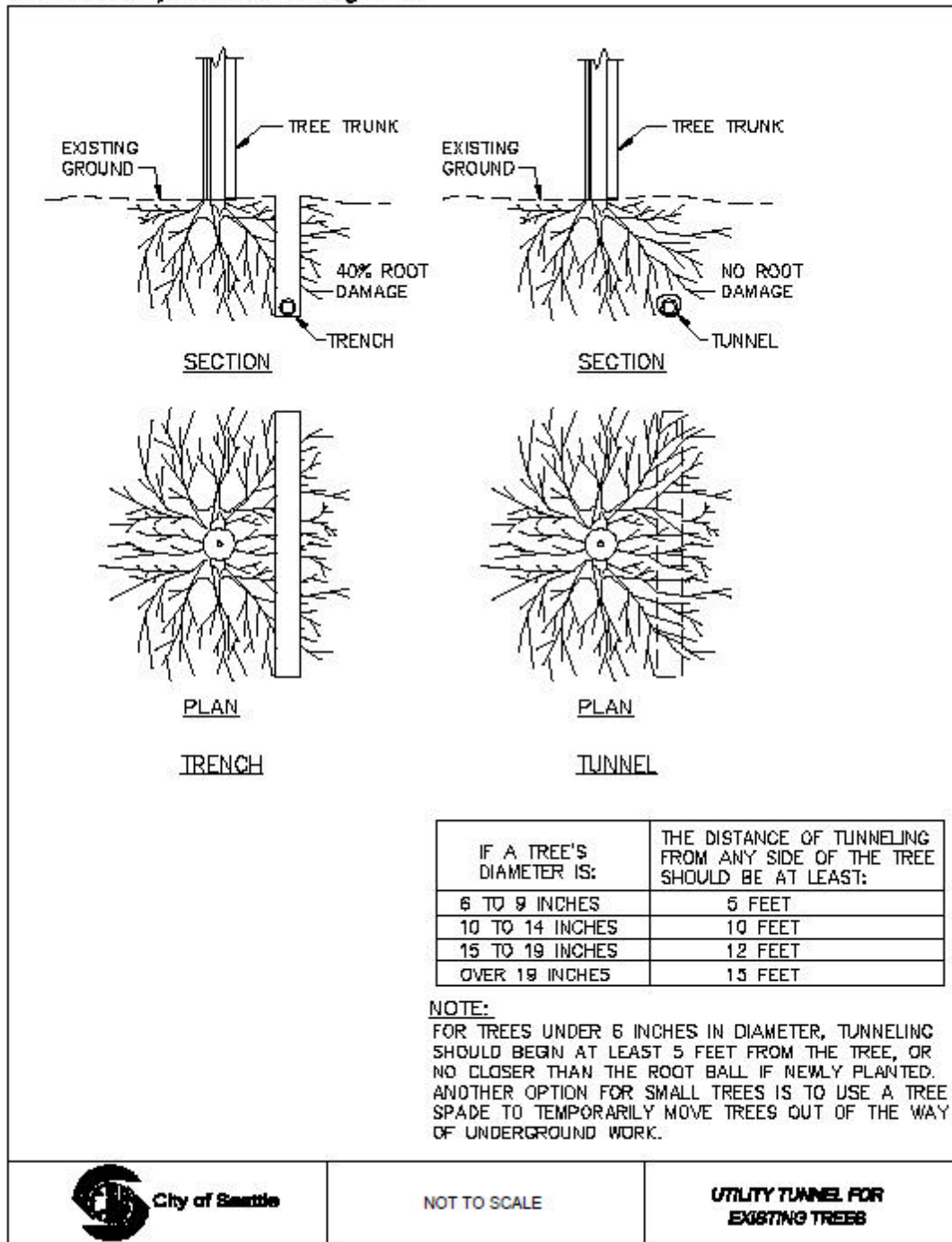
**Exhibit 17. Curb Discharge/Concrete Culvert With Plate**



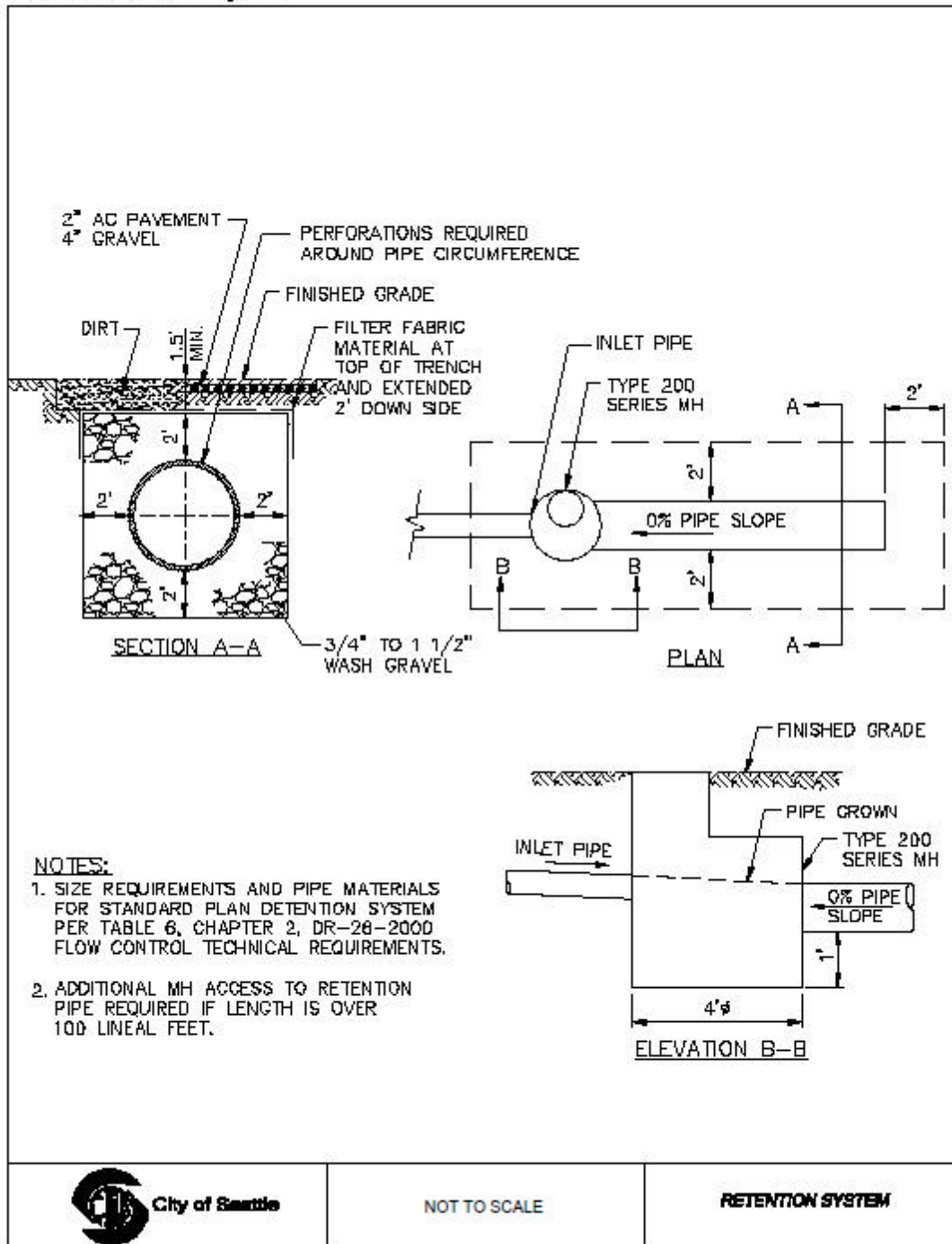
**Exhibit 18. Curb Discharge/Pipe Culverts**



**Exhibit 19. Utility Tunnel For Existing Trees**



**Exhibit 20. Retention System**



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NOT TO SCALE

**RETENTION SYSTEM**

**Exhibit 21. Maintenance Hole Lid Using Locking Screws**

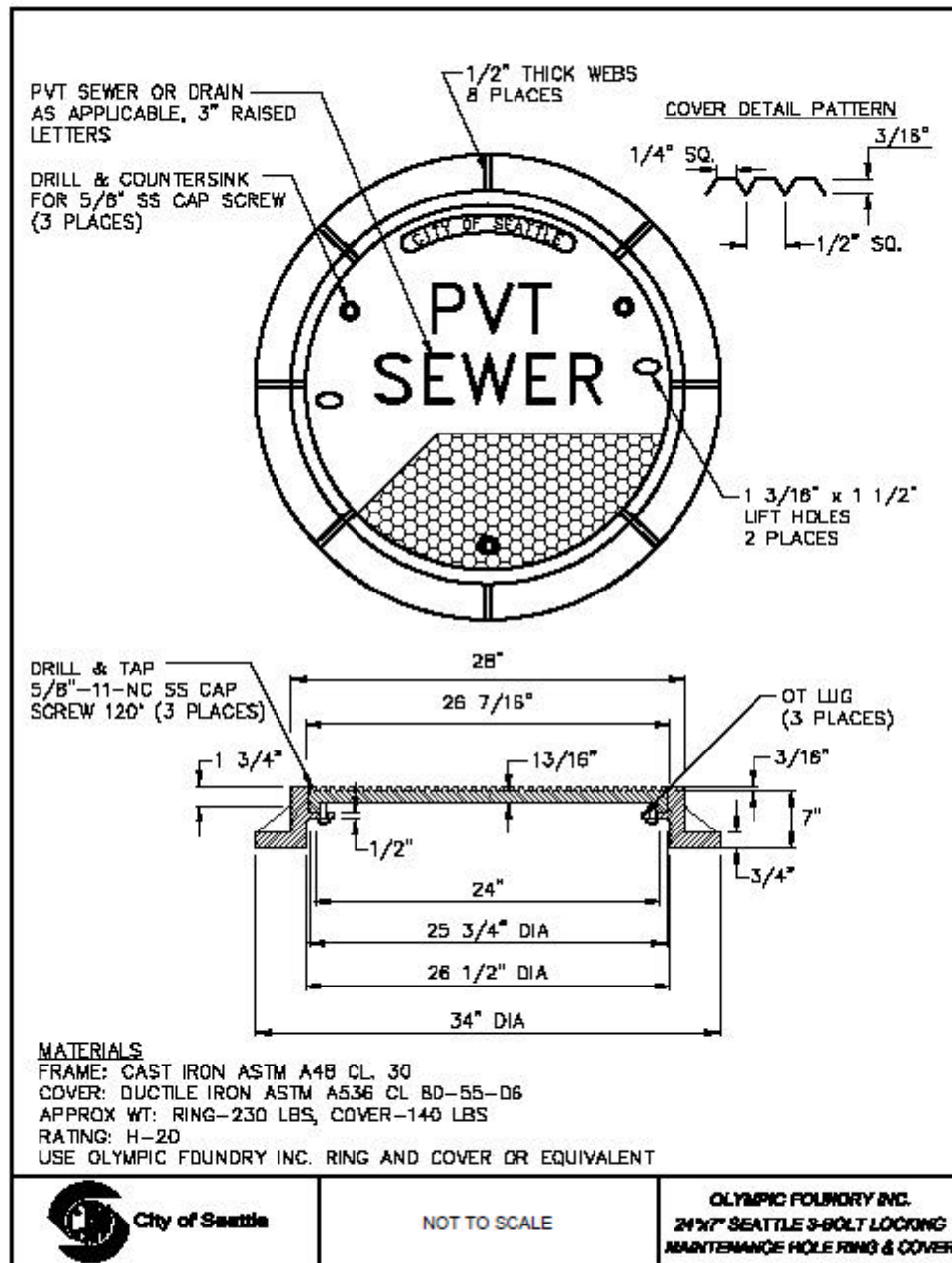
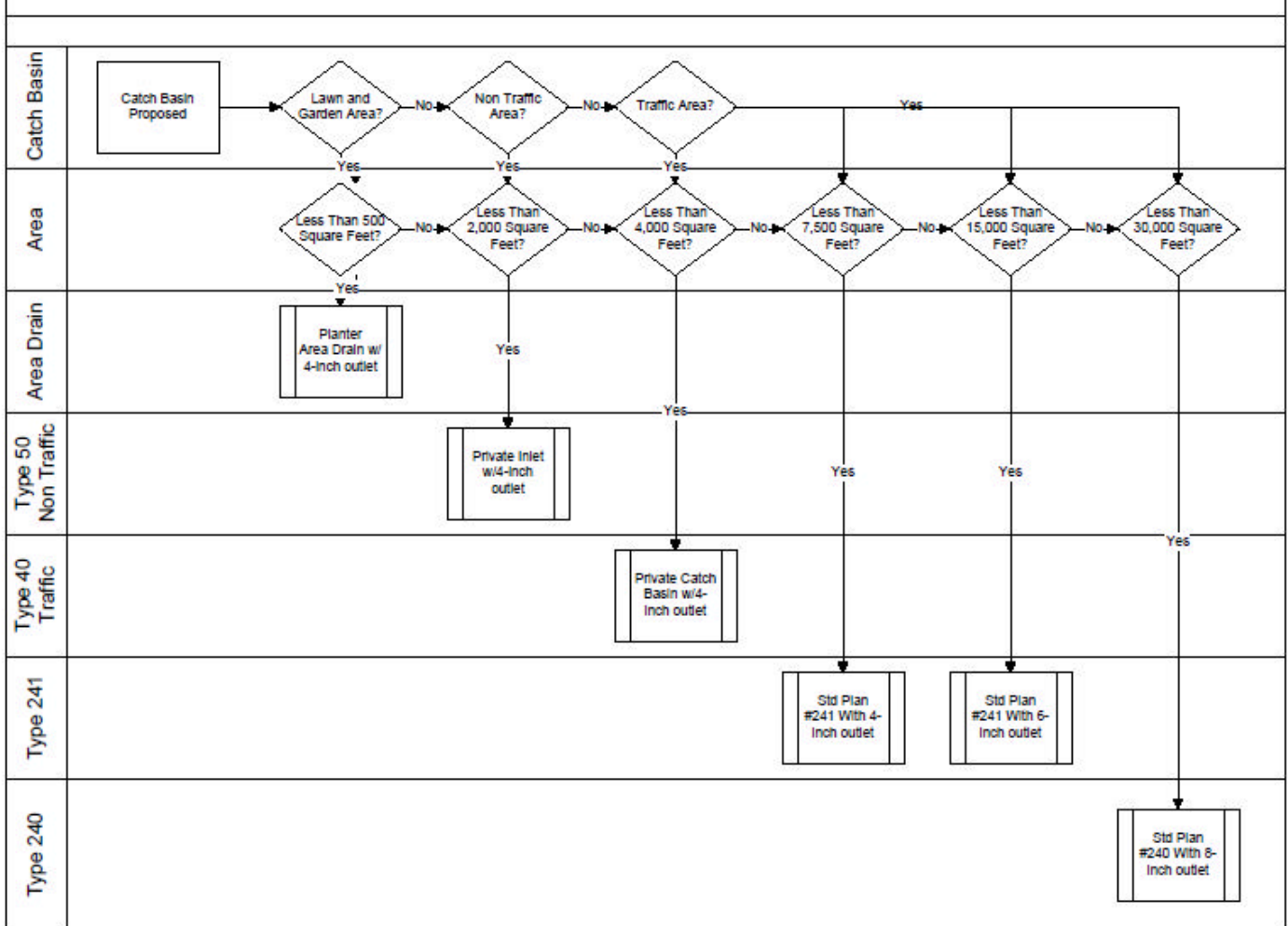


Chart No. 1 - Service Drain - Catch Basin Area Requirements



### Chart No. 2 - Drainage Requirements

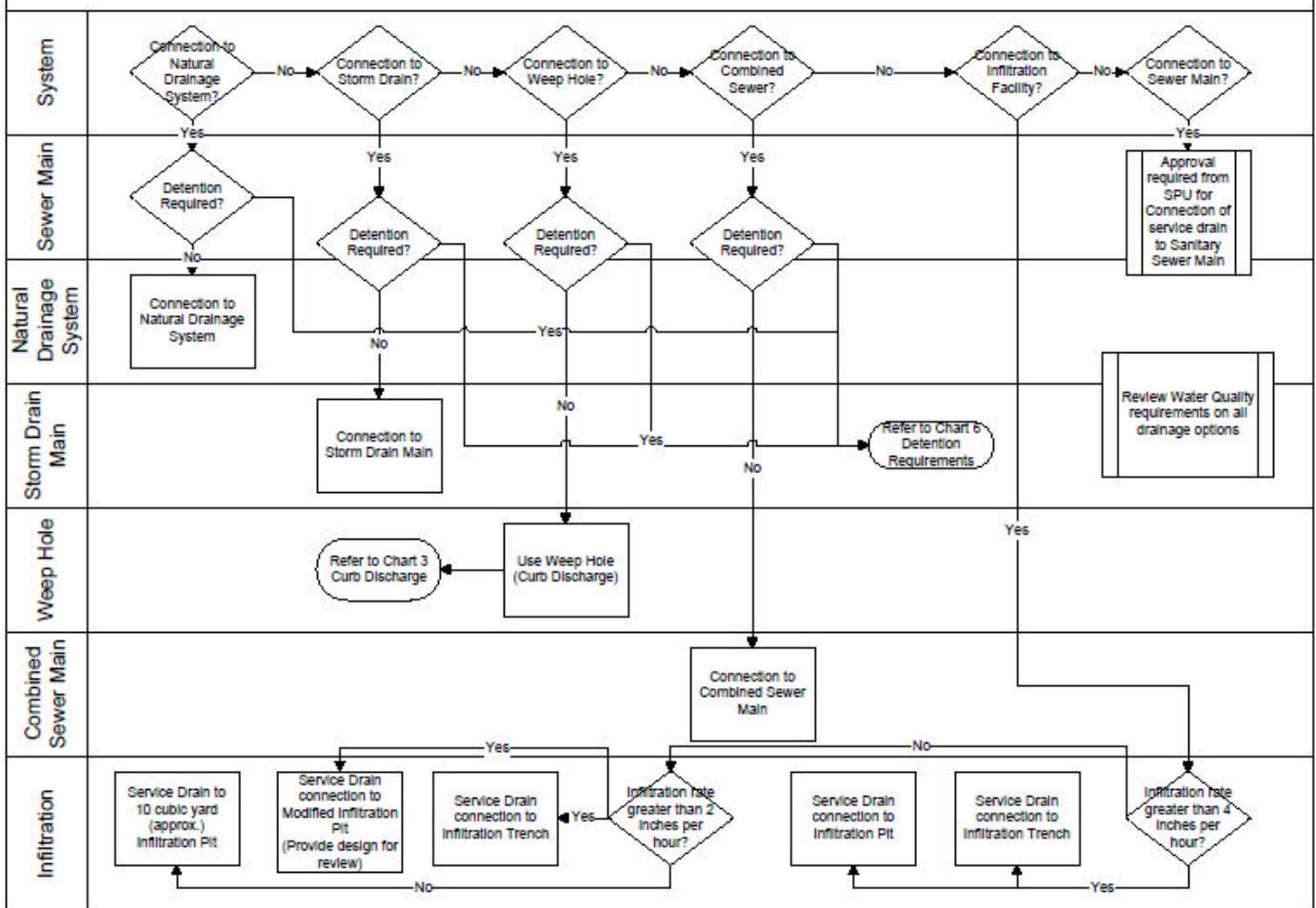
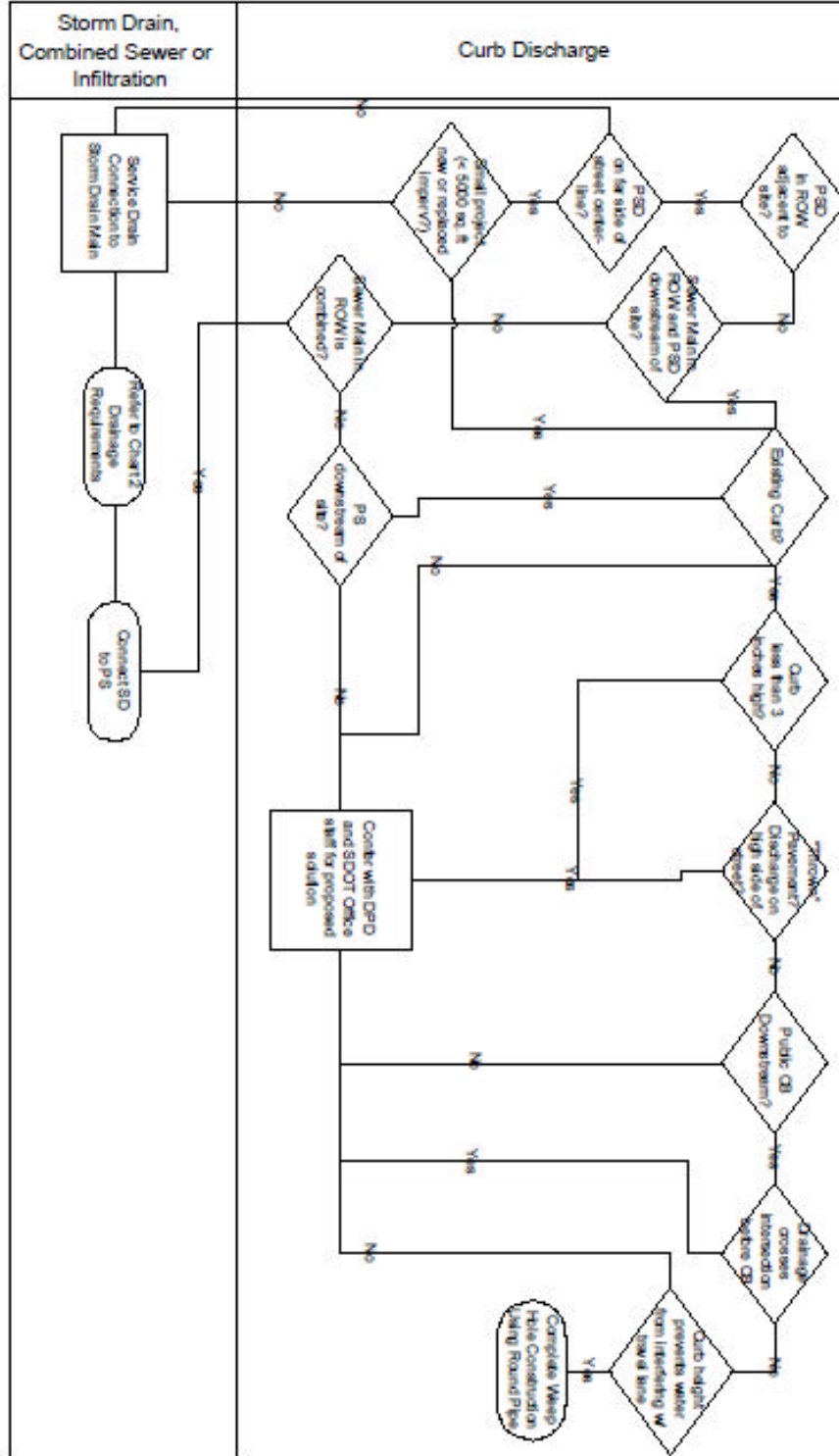


Chart No. 3 - Service Drain - Curb Discharge for Stormwater



**Legend**  
 PSD = Public Storm Drain Main  
 SD = Service Drain  
 PS = Public Sewer Main  
 PSB = Public Combined Sewer Main  
 SS = Side Sewer  
 CB = Catch Basin

Chart No. 4 - Service Drain - Downspout

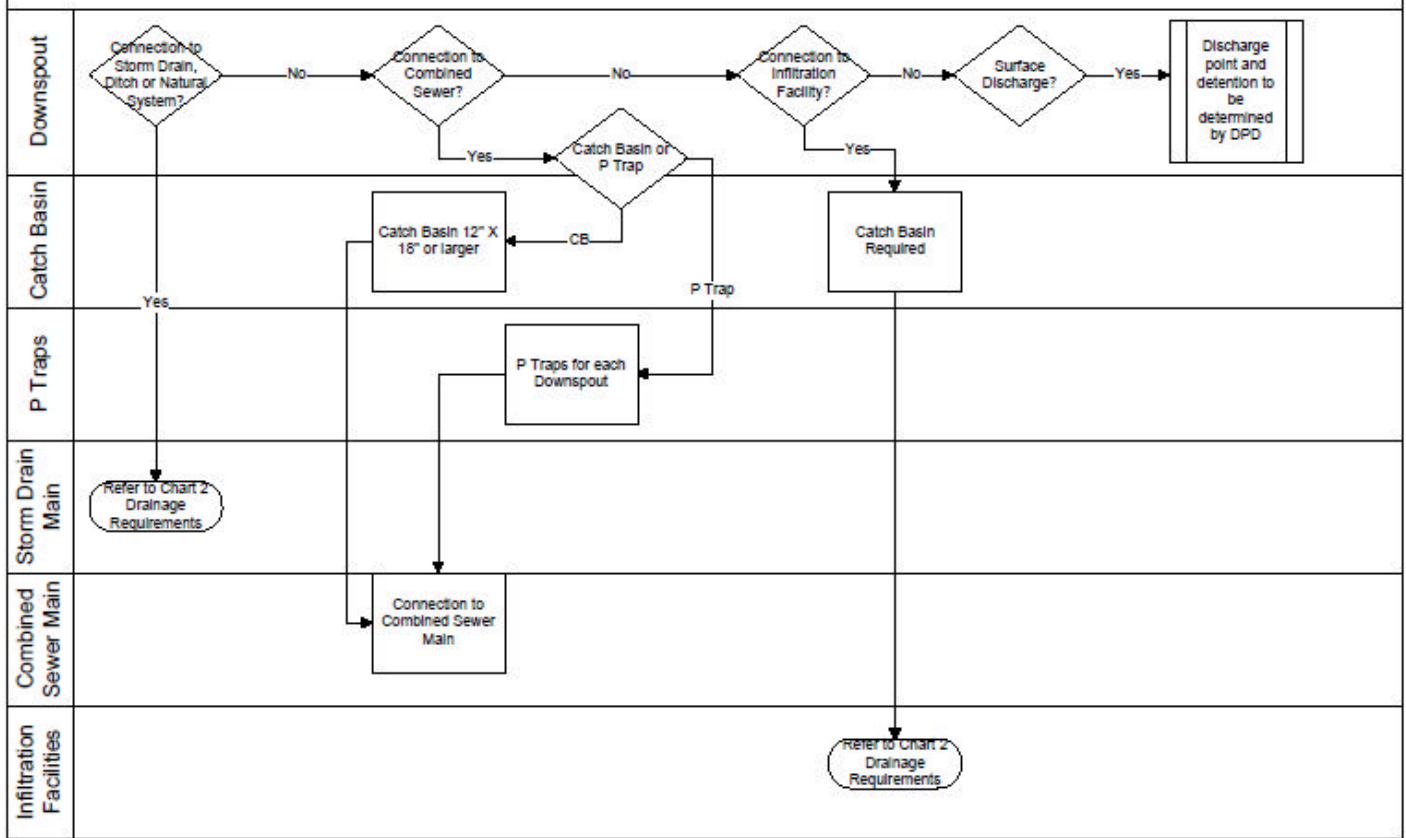


Chart No. 5 - Service Drain - Footing Drain

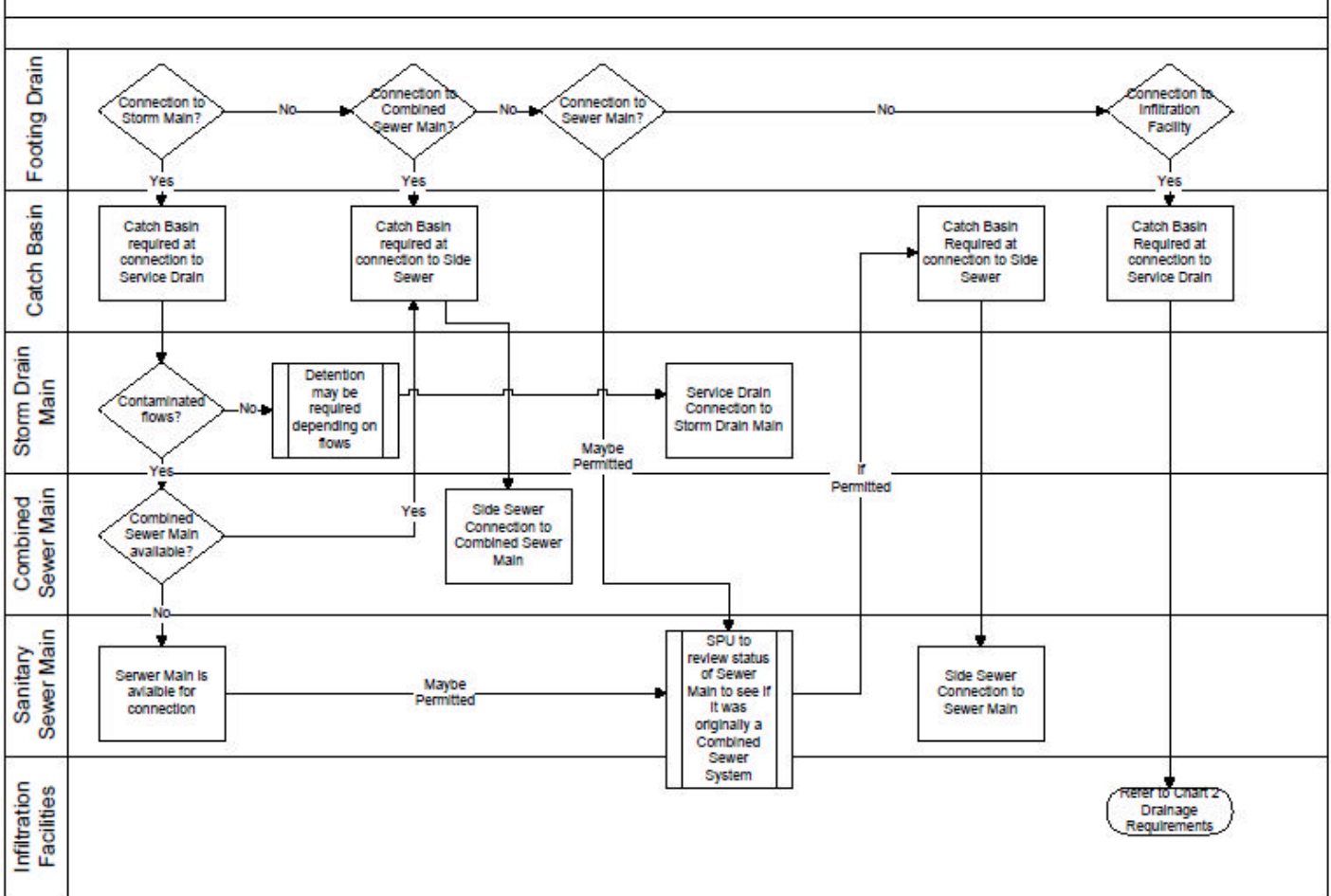


Chart No. 6 - Detention Requirements

